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SUMMARY

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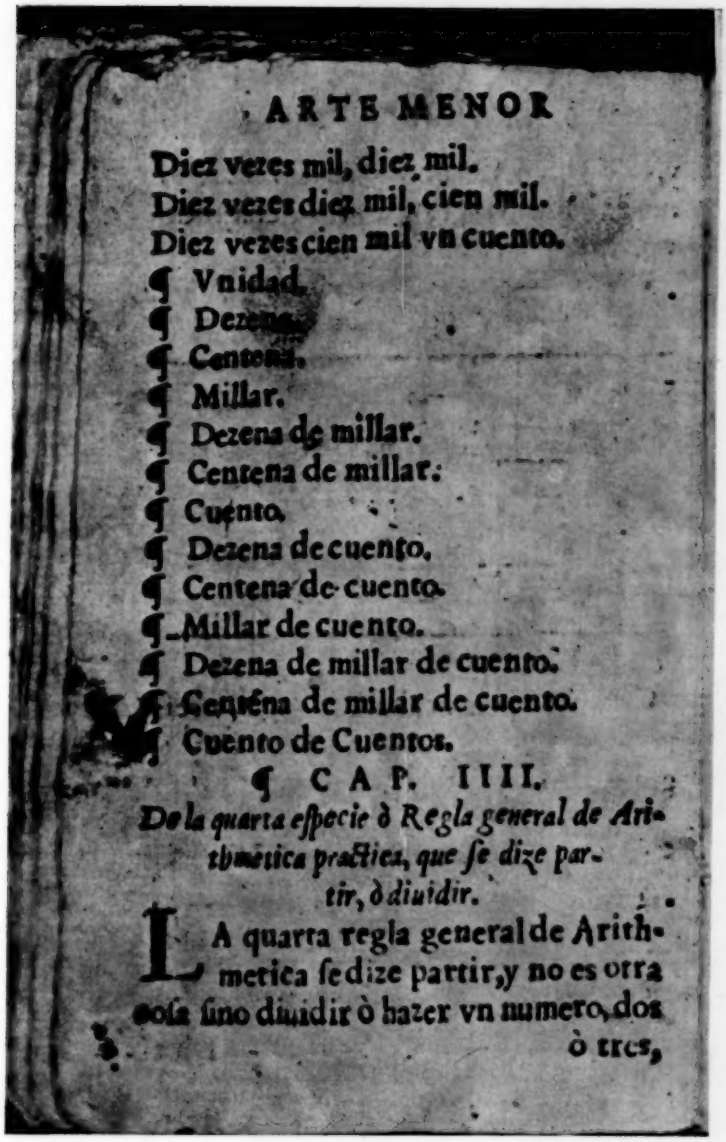


ARTE MENOR

Diez vezes mil, diez mil.
Diez vezes diez mil, cien mil.
Diez vezes cien mil vn cuento.

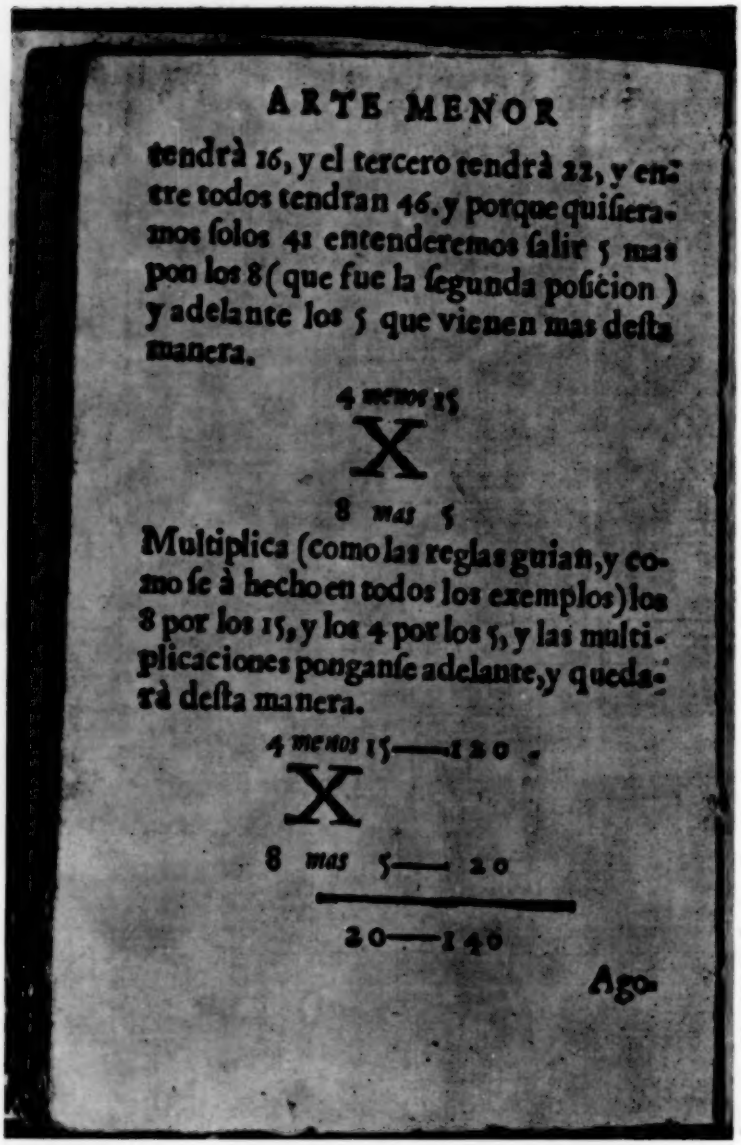
¶ Vnidad.
¶ Dezena.
¶ Centena.
¶ Millar.
¶ Dezena de millar.
¶ Centena de millar.
¶ Cuento.
¶ Dezena de cuento.
¶ Centena de cuento.
¶ Millar de cuento.
¶ Dezena de millar de cuento.
¶ Centéna de millar de cuento.
¶ Cuento de Cuentos.

¶ CAP. IIII.

De la quarta eſpecie ò Regla general de Arithmetica practica, que ſe dize partir, ò diuidir.

LA quarta regla general de Arithmetica ſe dize partir, y no es otra coſa ſino diuidir ò hazer vn numero, dos ò tres,

Fig. 1. — Paz's Arithmetica, 1623, fol. 19B. Notice the use of *Cuento* and *Cuento de Cuentos* for 10^6 and 10^{12}.



ARTE MENOR

tendrà 16, y el tercero tendrà 22, y entre todos tendran 46. y porque quisieramos solos 41 entenderemos salir 5 mas pon los 8 (que fue la segunda posicion) y adelante los 5 que vienen mas desta manera.

4 menos 15

X

8 mas 5

Multiplica (como las reglas guian, y como se à hecho en todos los exemplos) los 8 por los 15, y los 4 por los 5, y las multiplicaciones ponganse adelante, y quedarà desta manera.

4 menos 15 —— 120

X

8 mas 5 —— 20

20 —— 140

Ago-

Fig. 2. — Paz's Arithmetica, fol. 179B. (*See* note at the end of the article)

The Earliest Arithmetic published in America

In the City of Mexico the printing press began to function as early as the second quarter of the sixteenth century, but the earliest American arithmetics did not appear before the seventeenth century. Bibliographers (1) give only two regular texts on arithmetic published in America during the seventeenth century, namely the arithmetics in Spanish written by PEDRO DE PAZ (2) in 1623, and ATÀNASIO REATON (3) in 1649, both printed in the City of Mexico. The earliest arithmetic brought out as a separate treatise *in English* was that of JAMES HODDER, printed in Boston in 1719, or ninety six years after the arithmetic of PAZ. While the Mexican arithmetics were of American authorship, the early arithmetics of colonial United States were of European authorship, except that of ISAAC GREENWOOD.

Before 1623, four mathematical books were published in Mexico : the *Sumario* by JUAN DIEZ FREILE (4), 1556, an *Instrvccion navthica*

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(1) José TORIBIO MEDINA. *La Imprenta en México*. Vol. 2, Santiago de Chile, 1907, p. 100, 109, 274, 275.

VICENTE DE PAULA ANDRADE. *Ensayo Bibliográfico Mexicano del Siglo XVII*. 2. Ed., México, 1899, p. 160, 762, 763.

J. G. ICAZBALCETA, *Bibliografía Mexicana del Siglo XVI*, México, 1886, p. 64,

J. M. BERÍSTAIN Y SOUZA, *Biblioteca Hispano Americana Setentrional*, 2. Ed., Vol. 2, 1883, p. 409; Vol. 3, p. 11.

(2) *Arte para aprender todo el menor del Arithmetica, sin Maestro. Dirigido al Doctor Don* DIEGO DE GUEVARA Y ESTRADA, *Chantre de la sancta Iglesia Metropolitana de Mexico. Hecho por* PEDRO DE PAZ *Contador de la dicha sancta Iglesia. — Con privilegio. Impresso en Mexico por Ioan* RUYZ. *Año de* 1623.

(3) *Arte menor de Arismetica, y modo de formar campos. Trata las cventas qve se pveden ofrecer en los reynos de sv Magestad : por estilo mvy claro, y breve para qve se aprendan sin maestro. — Por* ATÀNASIO REATON PASAMONTE, *Mexico, Por la Viuda de* BERNARDO CALDERON, *Año de* 1649. REATON's book has been well described by L. C. KARPINSKI in *Science*, Vol. 63, 1926, p. 193-195. In that article KARPINSKI gives a brief account of another arithmetic that we shall mention, the one by FERNANDEZ BELO. (See *Isis IX*, 160).

(4) *Sumario cõpẽdioso de las quẽtas de plata y oro q en los reynos del Piru son necessarias a los mercaderes : y todo genero de tratantes Cõ algunas reglas tocantes al Arithmetica. Fecho por* JUAN DIEZ *freile — en casa de* JUAN PABLOS BRESSANO. *— Mexico*, 1556. A facsimile edition of part of the *Sumario*, with a translation into English, was brought out by DAVID EUGENE SMITH in 1921.

by GARCIA DE PALACIO (5) in 1587, a *Kalendario perpetuo* by FRAY ALEJO GARCIA (6), of the convento imperial de Mexico, who died in 1579 or 1580, and a text on church tithes, written in 1621, by PEDRO DE PAZ (7), the author of the first arithmetic. None of these four books contained a regular, systematic exposition of the fundamental processes of arithmetic. The first deals primarily with the prices of various grades of silver and gold. The second is on navigation, the third is on the calendar, and the fourth is on the distribution of tithes received by the Mexican churches. The last three books we have not seen.

From MEDINA'S *La Imprenta en Lima*, Vol. I, p. 44, we gather that a work by IOAN DE BELVEDER, similar to that of JUAN DIEZ FREILE was published in 1597 at Lima in Peru (8).

A military arithmetic of seventeen folios was published in 1675, in Mexico, by BENITO FERNANDEZ DE BELO (9), who was a native of Burgos in Spain and had a chequered military career. The book assumes a knowledge of fundamental processes but explains division and square root, and deals with the formation of soldiers into squares, hollow squares, rectangles and certain other polygonal forms.

Pedro de Paz's Arithmetica.

No copy of this earliest book, given to the systematic treatment of arithmetic, and published on the American continent, is in the Biblioteca Nacional of Mexico. In 1899 two copies (both

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(5) *Instvccion navthica, para el bven Vso, y regimiento de las Naos, su traça, y gouierno conforme à la altura de Mexico. Cõpuesta por el Doctor* DIEGO GARCIA DE PALACIO. — *Mexico, en casa de* PEDRO OCHARTE, 1587.

(6) J. M. BERÍSTAIN, *op. cit.*, Vol. II, 1883, p. 20.

(7) *Declaracion de los puntos convenientes y necesarios para repartir con exactitud las Rentas eclesiasticas en las catredales de la Nueva España. Por* D. PEDRO PAZ, *contador de diezmos de la Iglesia Metropolitana de Mexico. Mexico,* 1621. 4°

(8) *Libro general delas redvciones de plata, y oro de diferentes leyes y pesos, de menor à mayor cantidad, y de sus interesses à tanto por ciento, con otras reglas y auisos mvy necessarios para estos Reynos del Piru. Compvesto por* IOAN DE BELVEDER, *natural de la villa de Tauste. en el Reyno de Aragon. — En Lima por* ANTONIO RICARDO. *Año de M. D. XCVII.*

(9) *Breve aritmetica por el mas svcinto modo, qve hasta oy se ha visto : Trata en las quentas que se pueden ofrecer para formar Campos, y Esquadrones — por* D. BENITO FERNANDEZ DE BELO — *Mexico* 1675. The Library of the University of Michigan courteously loaned a photostat copy of this book for my use.

somewhat incomplete) were reported to be in private libraries (10) in Mexico city, one copy owned by Sr. SÁNCHEZ DEL CASTILLO, and the other by Dr. NICOLAS LEÓN. Dr. LEÓN informs me that SÁNCHEZ DEL CASTILLO's library has been dispersed and the disposition of its copy of PAZ is not known. It is through the great courtesy and good offices of Dr. LEÓN that the library of the University of California secured a part of an original copy of PAZ and a photostat reproduction of such other parts of the book as exist in Dr. LEÓN's more complete copy. The original plus the photostat still leave some gaps (11). The arithmetic of PAZ contained altogether 189 folios.

A Sonnet and Prologue. These are missing in the University copy, but they are reproduced by MEDINA (12), and other bibliographers. We give the former in the original :

Soneto

Entré, amigo Lector, conmigo en *Cuenta*,
Queriendo darte *Cuenta* de esta Obra,
Y por mi *Cuenta* hallé que aquello sobra,
Que se pone de galas en la *Cuenta*.

Y así no es mi intención ponerme en *Cuenta*
Con los que el tiempo *Cuenta*, y de quien cobra
Nombre la *Cuenta*, en que su ingenio obra
Primores, de que agora no hago *Cuenta*.

Lo que á mi *Cuenta* tomo es darte llanos
Los ásperos caminos de la *Cuenta*,
Que en esto se des *Cuenta* mi cuidado.

Ten *Cuenta*, pues, y toma entre las manos
Este Libro, y si de él hicieres *Cuenta*
Quedarás en la *Cuenta* aprovechado.

(10) VICENTE DE P. ANDRADE. *Ensayo Bibliográfico del Siglo XVII*. 2. Ed., Mexico, 1899, p. 762, 763, No. 115.

(11) The missing parts are the title page, three folios of the introductory part, folios 2-8, 42, 73 and a part of the table of contents at the close.

(12) MEDINA. *La Imprenta en México*, Vol. 2, p. 109.

This sonnet is a skilful play on the word « cuenta » which is given different meanings, as the following free translation shows :

Dear student, I pondered within myself how best to instruct you by means of this little treatise, and I came to the conclusion that the most important factor in the representation of arithmetic is putting it in an attractive form. — And so it is not my intention to devote my efforts to those who have peculiar advantages of study, or to those who expect to make a reputation from this science by super-reasoning powers. — At present I do not care to cater to such. — What I aim to do is to smoothen the difficult paths of arithmetic; then, I consider that I have fulfilled my contract. — Be wary, then, in taking up this work. If you study it diligently, you will improve yourself considerably in the science of numbers.

« Prologue to the discreet Reader » :

« When I made up my mind to begin this treatise (curious reader), I intended to compile a work that would include the entire science of elementary arithmetic and algebra (aritmética de arte menor y mayor) as well as all the complicated methods for the solution of the problems that might come to my knowledge. Naturally I would give preference to those that were simplest and briefest and would arrange them in sequence to the best of my ability. (My compensation for the time spent in such a work would necessarily be my pleasure in studying the science for its own sake. Since childhood, I have devoted myself so consistently to mathematics that my reward should be the ability to compile a work that would really satisfy me and be comparable to my ambition.) Assuming that I did accomplish such an undertaking, I considered further how many-sided must be the branches of the science presented and how those persons with little leisure for such pursuits would be confused by endless rules appearing in a complicated and compendious treatise on mathematics. Then I desisted from my original purpose, and sought to include in this little volume all that is most profitable and simple, and it seems to me that this plan is the right one and consequently successful. Nothing is more necessary to this country than a book from which can be learned without a teacher all the essential rules for integers and fractions, omitting only

those that are unimportant. Such an arithmetic would be useful in all business transactions. I decided, however, that a second volume is needed for the acquisition of and mastering of rules and ordinary symbols, without sparing expense, time or trouble, as this would be a great assistance in rapid calculating, and would be equally helpful to all ranks, professions, ages and occupations. Many men need instruction in these branches, of whom, some who are eager to learn cannot secure the services of a teacher and even the ones who would have this opportunity, would find this method very useful and later on may desire the second volume. This will contain the more advanced work, as well as the algebraic symbols in use today which are both simple and easy to learn. Included also will be the tables for the reckoning of the cathedral dues, all fully worked out. There will also be presented in it many problems in geometry, solved by the algebraic method (por la regla de la cosa). In order to understand all the problems in the second volume, it will be necessary to study and master this one, which I deemed it fit and necessary to publish, in order to find out the essential points to be presented in the following volume, which I now promise to publish, provided that God will spare my life to do so, which blessing I desire for the sole purpose to serving him and you. Adieu. »

The second volume did not appear. From the preceding, one gathers that PAZ was interested in mathematics from boyhood and that his profession — collector of tithes to the Metropolitan Church of Mexico — called for arithmetical proficiency. There is no direct evidence that he was a teacher of arithmetic.

Sources. PAZ refers in two places of his arithmetic to JUAN PEREZ DE MOYA who is the author of several mathematical works. In 1562 MOYA brought out at Salamanca in Spain the ***Aritmetica practica, y especulative***, a popular and meritorious work on arithmetic and algebra which, without revision or enlargement, reached its fourteenth edition, more than two hundred years later, at Madrid in 1784. Our references are to this fourteenth edition. PAZ who mentions no other Spanish writer is heavily indebted to MOYA; in truth, he had MOYA's arithmetic before him when writing his own. This is evident from the fact that some of the illustrative exercises are the same in both texts. Thus PAZ (fol. 127) gives the terms 7 — 9 — 2 and also 2— 6 — 3, in ex-

plaining the rule of three; MOYA on page 139 uses the same numbers. In some cases the explanations are in the same words. For example,

PAZ (fol. 67 B):

« Otro exemplo. Qual es mas 2 tercios, ò tres quintos? Ponganse en figura, y multiplica en Cruz (como emos mostrado) y vendran sobre los $\frac{2}{3}$ diez, y sobre los tres quintos 9 y por que diez es mas que nueuve, y vemos el 10 sobre los 2 tercios, y el 9 sobre los 3 quintos, por tando diremos que es mas 2 tercios de vna cosa que 3 quintos de la mesma cosa: y no se dize quanto, porque se deja para la regla de restar en quebrados.

Nota, que quanto mayor fuere la denominacion de vn quebrado, tanto serà menor el quebrado: y al contrario, quãto fuere menor, tanto serà mayor como se dixo al principio. »

PEREZ DE MOYA (p. 93):

« Otro exemplo. Quál es mas, dos tercios, ò tres quintos? Pongase en figura. Y multiplica en cruz, como hemos mostrado, y vendrá sobre los tercios 10. y sobre los $\frac{3}{5}$ 9. y porque el 10. que está encima de los dos tercios, es mas que los 9. que están sobre los $\frac{3}{5}$ por tanto dirás, que es mayor de valor $\frac{2}{3}$ de una cosa, que $\frac{3}{5}$ de la misma cosa. [Here follows the figure as in Paz.] Saber quánto es mas un quebrado que otro, el restar de quebrados lo demostrará. Nota, que quanto mayor fuere la denominacion de un quebrado, tanto será menor. Y al contrario, tanto quanto fuere menor, tanto será mayor, como se dixo en el 5. principio. »

A similar parallelism occurs in the next example, also in an example (PAZ f. 131 and MOYA, p. 141), and in still another (PAZ f. 132, MOYA, p. 142).

Topics treated. PAZ takes up, in order, the processes of addition, subtraction, multiplication (including full explanation of the multiplication table which is given in abbreviated form so as to avoid repetitions like 3×6 and 6×3), and division of integers,

and their applications to problems on money, weights and other measures. Then follow the four fundamental operations with common fractions, the simple rule of three (proportion) involving integers, then involving common fractions, and finally the mixed rule of three with time as an additional variable. Thereupon come exercises involving a sort of chain-rule, the rule of company (partnership), and simple and double false position. Results are « proved » or checked, but not by the process of casting out the 9's which was widely used by most European authors of that time. There are 21 chapters covering 181 folios. PAZ does not give decimal fractions, nor applications to geometry. One writer states that PAZ explains in this book the distribution of tithes received by the churches. This is not true; PAZ does this in his earlier book of 1621. In the seventeenth century many European arithmetics pay no attention to decimal fractions, even though the theory of these fractions was fully explained by the Belgian mathematician SIMON STEVIN in 1585. The earliest American author giving a full account of decimal fractions is ISAAC GREENWOOD of Harvard College, in his *Arithmetick, Vulgar and Decimal*, Boston, 1729.

General mode of treatment. Intended for readers wholly unacquainted with the rudiments of arithmetic, who may desire to study the subject without a teacher, the arithmetic is very diffuse. Conscious of this, PAZ promises at the close of the book that his second volume containing the algebraic symbols, will be easy to master although « without such lengthy explanations as were necessary in this. » Immature readers first approaching arithmetic doubtless derived little or no help from PAZ's definitions. For example, one of the definitions of multiplication has reference to proportion, which is not previously explained and apparently is assumed as intuitively evident. But the reader is not seriously halted thereby. Skipping the definitions, he arrived at a comprehension of arithmetical operations by the study of the numerous examples which are explained in great detail.

Notation. PAZ uses the Hindu-Arabic numerals in the exercises and in numbering folios. The Roman numerals occur only in numbering the folios preceding chapter I and in marking

octavo parts of the book, at the foot of certain pages. He gives the Roman four in the form iiij, never in the form IV. In Roman time the IV seldom occurs, and even later it did not secure complete ascendancy over the four strokes IIII. PEREZ DE MOYA confines himself to the latter. The elongation downwards of the letter i in the final stroke, as found also in PAZ's ij and iij for *two* and *three*, had become quite common in the eleventh and later centuries. In the running text, PAZ frequently departs from the ordinary mode of writing common fractions, by expressing the numerators in numerals and the denominators in words; thus « 7 nouvenos » was written for seven-ninths. This procedure removed the temptation of using very small numerals in fractions or of separating the printed lines abnormally, to make room for fractions with numerals of the size of the letters in the text. Another peculiar symbolism in PAZ which is found also in PEREZ DE MOYA and some other old European texts is a zero placed over a dash o to indicate « half ». Early in his book (fol. 19) : PAZ denotes $5\frac{1}{2}$ thus « $5 - o$ », but later he regularly writes « $\frac{1}{2}$ ». PAZ uses no other mathematical symbols (as was indeed the custom in arithmetics of the time), unless we designate the dash — and the principal letter X by that name. That is, PAZ does not employ symbols for plus, minus, multiplication (except the dash), division and equality. As stated in the Prologue and also at the close of the book, PAZ planned in a second volume to use « los majores Caracteres », as he called the algebraic symbols.

The dash and the X played a truly important part in PAZ' book and in early printed arithmetics generally. The dash served one or the other of two distinct functions : (1) to separate numbers, (2) to indicate multiplication. The former use is seen in

$7 - 9 - 2$ which stood for our $7 : 9 = 2 : x$

The second use is seen in

$3 - 4$, yielding 12.

The X did not signify one multiplication; it was not one symbol, but two superimposed symbols (two dashes) indicating two multiplications. This X rendered efficient aid in the reduction of fractions to a common denominator, in addition, subtraction, and division of common fractions, in the solution of proportions

involving fractions, and in double false position. The two strokes in X indicated what numbers should be multiplied together. For example (fol. 131), if $\frac{2}{3}$ yd. of cloth is worth $\frac{4}{7}$ ducados, how much is $\frac{1}{8}$ yd. worth? Write

$$\begin{matrix} 2 & & 4 & \text{——} & 1 \\ & X & & & \\ 3 & & 7 & \text{——} & 3 \end{matrix}$$

Multiply together the numbers connected by dashes: $3 \times 4 \times 1 = 12$ $2 \times 7 \times 3 = 42$. Answer: $\frac{12}{42}$ or $\frac{2}{7}$. As guides to an inexperienced traveler in the dubious paths of arithmetic, these dashes surpass even ARIADNE's famous threads.

Wholly unexpected is PAZ's omission of the calderon, a symbol resembling U and signifying « thousands », which is found in some early Spanish arithmetics, particularly in the one of PEREZ DE MOYA (who gives on p. 13 the form resembling the Greek sampi ϡ, and also in DIEZ FREILE's *Sumario*, as well as in very many Spanish-American books and manuscripts. The number 35259 was written 35U259, the « U » separating the thousands from the hundreds, thereby facilitating the reading of the number in the same way as does the « comma » in 35,259. In Spanish-American business documents the U occurs often, but in the explanation of fundamental operations, in arithmetical books the « U » was in the way, and was therefore omitted. This fact and PAZ's infrequent use of large numbers may account for his omission of the calderon altogether.

Pesos and the Dollar Mark. Following the common practice among Spanish writers, PAZ represents pesos by « ps. » This abbreviation is of special interest to Americans, because it has been shown from the study of manuscripts that in the eighteenth century the modern dollar mark $ descended from « ps. » (13)

Multiplication. Besides the ordinary procedure, PAZ (fol. 12) and PEREZ DE MOYA (p. 41) gave a clever way, which is not often found in arithmetics, of multiplying mentally two numbers between 10 and 20, say 14 and 17. We explain the process briefly, by the aid of modern symbols, thus: $14 + 7 = 21$, call this 210; $4 \times 7 = 28$; $210 + 28 = 238$. Similarly for 23×25; $23 + 5 = 28$, *doubling* gives 56; call it 560; $3 \times 5 = 15$,

(13) F. CAJORI. « The Evolution of the Dollar-mark ». *Popular Science Monthly*, Vol. 81, 1912, p. 521; *Science*, Vol. 38, 1913, p. 848; *School and Society*, Vol. 21, 1925, p. 625.

$560 + 15 = 575$. The same for 32×31, except that one must *treble*, and so on. PAZ does not hesitate to use phrases involving concrete multipliers, such as (fol. 13 B), « se multipliquen veinte y tres varas de paño à tres pesos; » the product is called « pesos. »

Division. PAZ's long division is not quite what the English call the « scratch method », for he does not « scratch » or cross out the numerals when no longer needed. Perhaps the Mexican printing press had no cancelled numerals in its fonts. But the real reason why PAZ did not scratch is more likely that PEREZ DE MOYA did not scratch. There is little or no gain in the method. Historically, this process takes the place of the removal of a digit from a surface covered with sand or liquid paint, which became necessary for want of space. The scratching on paper or on a slate did not save space and was a rather senseless imitation of the earlier process. The Italians called the division taught by PAZ the galley method. The remainders are written above the dividend; the divisor is placed below the dividend and is moved one step to the right for every new numeral obtained in the quotient. The same process, without scratching, was adopted by JUAN DIEZ FREILE in his *Sumario* and by FERNANDEZ DE BELO in his military arithmetic.

Cuento. One of the curiosities of some Spanish arithmetics, including the books of PEREZ DE MOYA, DIEZ FREILE and PAZ, is the use of the word *cuento* to signify, not 1000 as stated by one historian, but 1,000,000. The words million, billion, etc., do not occur in PAZ. See pl. Fig. 1.

General Estimate. As an elementary text book for beginners, PAZ's book ranks well among early seventeenth century arithmetics. While it possesses no originality of treatment, it exhibits good judgment in the selection of topics for beginners. It omits the progressions, also square and cube root, finger reckoning, and computation with « contadores » (which is by dots and lines, or « auf den Linien » as the Germans called it). All these topics were treated by PEREZ DE MOYA in the arithmetical part of his work. Numerous illustrative solutions render PAZ's presentation concrete. His educational philosophy is *teaching by example.*

Little Demand for arithmetics. It is noteworthy that PAZ's

and REATON's arithmetics did not reach second editions. It is even more surprising that in the eighteenth century in Mexico the printing of arithmetics received less attention than in the seventeenth century. An anonymous tract of eight pages, on the explanation of the « five rules of computation », in 1774, is all that appeared (14). Bibliographers mention the publication of calendars, ephemerides, tables on values of silver and gold ores, books on hydraulics and physics, and also some lectures and theses on mathematics at the University of Mexico. The eighteenth century printing press in Mexico made some provision in mathematics for the few more advanced workers, but it supplied not even the multiplication table to the great masses of the people. In Guatemala there was printed in 1732 a short collection of rules in arithmetic, which ended with a paragraph on the excellencies of the number seven (15).

University of California. FLORIAN CAJORI.

February 4, 1927.

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(14) *Declaracion de las cinco reglas de contar, con otras curiosidades muy utiles para los principiantes.* Mexico, 1774. See MEDINA *La Imprenta en Mexico*, Vol. 6, p. 137.

(15) JUAN JOSÉ DE PADILLA. *Noticia breve de todas las reglas mas principales, de la Arithmetica practica.* 1732. See MEDINA, *La Imprenta en Guatemala*, 1910, p. 79.

(*) Pl. 17, Fig. 2. — PAZ's *Arithmetica* (fol. 179 B). Solution, by two false positions, of the problem : *Three men have together* 41 *ducados. The second has twice as many as the first, the third* 6 *more than the second. How many has each* ? Make two guesses (two false positions) that the first has, say, 4 and 8 ducados. The first guess yelds 26 as the joint sum, which is 15 short of 41. The second guess yelds 46 or an excess of 5. Proceed as shown above. Now 140 : 20=7, which is what the first man has.

The Philosophical Aspect of Education in Science

§ 1. WHEWELL *and the Place of Science in a liberal education*

During the first half of the nineteenth century, the Universities of Oxford and Cambridge were subject to ruthless criticism. WILLIAM WHEWELL (1794-1866) took up the cudgels on behalf of Cambridge at the time of the attacks of the *Edinburgh Review*. His balanced arguments were certainly the outcome of a consistent view of the aims of education. Like all other writers on education of his day, he judges the value of the various subjects of the curriculum from the point of view of the mental training they afford. The disciplinary view commended itself particularly to the austere Master of Trinity.

WHEWELL identifies a liberal education with the higher education provided for the upper classes, upon whom depend the order and prosperity of the community, a comfortable conclusion. He distinguishes between *permanent* and *progressive* studies (1). Among the permanent studies he includes the ancient languages and established branches of mathematics such as geometry and mechanics. He applies the epithet ' progressive ' to the comparatively modern sciences of chemistry, botany, geology, etc. He considers that both kinds of study should be included in a liberal education, but that the permanent studies must be taken first. WHEWELL would administer the powder before the jam.

One of the adverse criticisms of the writers in the *Edinburgh Review* was that Cambridge clung to old geometrical methods in the teaching of mathematics and neglected the newer analytical methods. WHEWELL is eloquent in his defence of geometrical methods as giving a training in reasoning. He tells us that analytic methods are mechanical. We are carried along « as

(1) W. WHEWELL. *Of a Liberal Education*. London 1845, p. 5.

in a railroad carriage entering it at one station and coming out of it at another, without having any choice in our progress in the intermediate space. » (2) With geometrical methods, on the other hand, the student is not borne along in this comfortable fashion. He has to think out each step, to refer to what has already been proved and be able to survey the whole problem from different angles. WHEWELL concludes that the character of the reasoning involved accounts for the success of mathematics in having trained many eminent lawyers. (3)

When the mind of the student has been trained by the discipline of the permanent studies, he may give his attention to other subjects. WHEWELL considers that chemistry though indispensable in the professional training for medicine, is not sufficiently systematised to form a good subject of study for students. He would have the young men learn the established sciences where the conclusions can be rigorously tested. He maintains that criticism and argument belong to the mature philosopher and that students at the university must learn to submit to authority. If allowed to express their opinions instead of « quietly forming their minds for future action » (4) WHEWELL fears that they will become shallow and conceited. They must learn to judge the value of different hypotheses in those established subjects where there can be no difference of opinion. Hence the permanent studies must come first. Rules must be learnt before reasons (5). Thus WHEWELL suggests that the various branches of Mathematics and Physics will supply the necessary discipline and that afterwards the student may proceed to Chemistry, Botany, etc. There is hint of the stern pedagogue behind all WHEWELL's arguments.

However, WHEWELL looks beyond the needs of the undergraduate and shows the value of a rich knowledge of science in a wide scheme of education. He maintains that the progressive studies since they involve discovery, exert a profound influence upon education. He discusses at length the influence of the

(2) *loc. cit.*, p. 41.
(3) W. WHEWELL. *Principles of English University Education*, p. 13.
(4) W. WHEWELL. *Principles of English University Education.* London 1845, p. 25.
(5) W. WHEWELL. *Of a Liberal Education* London 1844. p. 103.

scientific discoveries of one period upon the intellectual outlook of the succeeding period (6). He goes so far as to assert that « every great advance in intellectual education has been the effect of some considerable scientific discovery or group of discoveries. » (7) As we should expect, the historian of the *Inductive Sciences* makes a great point of the careful study of the work of the great investigators of the past. He urges the introduction of questions on the history of science in the Tripos examinations (8) and the giving of optional lectures at college on the historical development of science and on recent achievements in the progressive sciences (9).

WHEWELL's words were as the voice crying in the wilderness. Men did not heed him because the great battle waged on behalf of science had not yet begun. WHEWELL's methodical arguments were not sufficiently resounding to make themselves heard in the great world outside the universities. Science needed a champion who could appeal to the multitudes. Such a man was HERBERT SPENCER.

§ 2. HERBERT SPENCER *and education for complete living.*

HERBERT SPENCER (1820-1903) may be regarded as the philosopher of the scientific movement of the second half of the nineteenth century. He wrote at a time when biology was developing rapidly. The comprehensive outlook of the theory of evolution was applied by SPENCER to the problems of ethics and sociology. His extravagant generalisations found acceptance in an age that believed in progress and in its own sufficiency. His cry for the need of science in education found a ready response and his teachings were accepted not from the intrinsic value of his arguments but because of his recognised authority in other fields.

In his main work on education (10), HERBERT SPENCER begins

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(6) W. WHEWELL. *On the Influence of the History of Science upon Intelllectual Education.* Lecture delivered at the Royal Institution.. 1854.
(7) *Ibid.* p. 6.
(8) W. WHEWELL *Of a Liberal Education.* p. 206.
(9) *Ibid.* p. 213.
(10) H. SPENCER: *Education, Intellectual, Moral, Physical.* London 1861.

with the question « What knowledge is of most worth? » In his usual fashion he refers back to primitive customs and describes the love of ornament and display shown by the Orinoco Indians. He then points out that the same love of display is shown in contemporary education. In the curriculum he explains that it is not what knowledge is of most worth that receives consideration but what knowledge is most imposing and most likely to bring applause. The shams of fashionable education, and in particular the accomplishments of young ladies invoke his stern disapproval.

HERBERT SPENCER classifies the activities of life under five heads : 1. those which directly minister to self-preservation; — 2. those which by securing the necessaries of life indirectly minister to self-preservation; — 3. those activities which have for their end the rearing and discipline of offspring; — 4. those which are involved in the maintenance of proper social and political relations; — 5. those miscellaneous activities which fill up the leisure part of life (11). SPENCER's ideal education is one which shall train adequately in all these directions and thus prepare for complete living.

He then proceeds to show how a knowledge of the different branches of science will give the knowledge required for complete living. His argument seems to be (1) It is of value to society that there should be some persons who have a full knowledge of some sciences; (2) society consists of individual men; (3) therefore each individual should learn all the sciences. He evidently feels that such encyclopaedic knowledge is a little too much to expect and so maintains that the aim of education must be to give a « due proportion » between the degrees of preparation in each of the sciences. He applies his classification of the activities of life to the problem of the school curriculum. But he does not enquire how far a child is capable of profiting by the knowledge of physiology which preserves life directly, nor how far such knowledge could be used by the hypothetical young mother who can read DANTE in the original. He does not discuss how far a child at school can profit by the psychology which enables parents to rear their children properly or by the physical sciences,

(11) *Ibid.* p. 9.

which, since they form the basis of industry, help to preserve life indirectly.

SPENCER distinguishes between the two values of every intellectual acquirement : (1) knowledge; (2) discipline. In his discussion of the disciplinary value of scientific studies he takes refuge in the *asylum ignorantiae* and baldly states that the acquirement of « facts most useful for regulating conduct involves a mental exercise best fitted for strengthening the faculties. It would be utterly contrary to the beautiful economy of Nature, if one kind of culture were needed for the gaining of information and another kind were needed as a mental gymnastic. » (12) Having disposed of an age-long problem in this simple manner, he proceeds to show that the discipline of science is superior to that of ordinary education because of the *religious* culture which it gives. True science, he maintains, is religious because it gives the student a faith in unchanging relations « in the invariable connection of cause and effect and in the necessity of good and evil results. » (13)

HERBERT SPENCER writes with such conviction that it is clear that he felt some moral effect resulted from the operation of physical forces. His writings reveal the characteristic nineteenth century attitude towards the inexorable laws of nature but the confusion with ethical principles and the ROUSSEAU-like *discipline des choses* seems peculiar to him. SPENCER's claim for science rested primarily on the ground of its utility. This aspect no doubt commended itself more than any other at a time when the applications of science were receiving recognition on all sides. The very exaggeration with which he illustrated his arguments compelled attention.

§ 3. HUXLEY *and retrospective prophecy.*

The cause of science was pleaded in more reasonable tones by T. H. HUXLEY (1825-1895). Even the most conservative upholders of the classical régime were ready to admit that science is useful. HUXLEY sought to show that science is also beautiful.

(12) H. SPENCER : *Education, Intellectual, Moral, Physical.* London 1861. p. 46.
(13) *Ibid.* p. 50.

The sunny side of his philosophy is revealed in his plea that children shall be led to love nature and to follow her ways in joyous pursuit.

HUXLEY's personification of nature leads him to regard Nature as an educator. But her methods are harsh. « Nature's discipline is not even a word and a blow, and the blow first; but the blow without the word. It is left to you to find out why your ears are boxed. ... The object of education..... is to make good these defects in Nature's methods, to prepare the child to receive Nature's education..... without waiting for the box on the ear. » (14) Life, he likens to a game of chess and education is « learning the rules of that mighty game. » (15)

Beginning with VOLTAIRE's story of Zadig, the wise man of Babylon, HUXLEY shows that retrospective prophecy is a marked characteristic, nay a definite function of astronomical science. He quotes the well known statement of AIRY that an eclipse of the sun was visible in Lydia on the afternoon of 28th of May in the year 585 B.C. HUXLEY points out that such a statement cannot be verified but that since the methods which astronomy uses when working forward lead to correct results, the same methods are trustworthy in working backwards to results not directly verifiable. This argument leads HUXLEY to his main thesis, namely that the methods of retrospective prophecy are legitimate for other sciences, since the method depends on what he calls the « fundamental axiom of the constancy of nature » which is the « common foundation of all scientific thought. » (16)

Throughout his *Essays* HUXLEY emphasises the different outlook that results from a knowledge of the results of science and hence shows the need for science in education. He shows how the history of science is the history of the growth of the conception of causality. Throughout his writings we find evidence of the prevalent belief in the externality of natural law. « Education, » he tells us, « is the instruction of the intellect in the laws of Nature under which I include not merely things and their forces but men and their ways. » (17) The

(14) T. H. HUXLEY. *Collected Essays*. London 1893. III, p. 85.
(15) *Ibid.* p. 83.
(16) *On the Method of Zadig*. Collected Essays, London 1893. Vol. IV. I. p. 12.
(17) *Collected Essays*. III. p. 83.

enormous development of scientific knowledge during the nineteen century led HUXLEY and other men to rely too much on what they conceived to be the methods of science. While retrospective prophecy might lead to the reconstruction of events seemingly as *real* as those due to our immediate sense impressions yet HUXLEY did not admit that the interpretation of past and immediate events depends on the use of certain instruments of thought which themselves require critical examination. It was not until after his time, however, that the serenity of men of science was disturbed by such doubts.

§ 4. *The Discipline of Science.*

The arguments brought forward in support of science teaching have frequently been based on the supposed mental training that science affords. The zealous partizans of science have affirmed that it trains the powers of observation, judgment and accuracy. Such statements are really based on what is known as the *Faculty Psychology*. According to this psychology, mental activity is supposed to involve certain elements or *faculties* such as observation, memory, discrimination and judgment. From time to time the presence of certain subjects in the school curriculum has been defended because of the supposed training of certain of these faculties. Since there was no way of isolating these elusive faculties and estimating the extent to which they had been trained there was no way of refuting the arguments of the schoolmasters. The importance of the *form*, that is the act of observation or judgment, received undue emphasis, while the material or content such as mathematics, science or Latin was regarded as relatively unimportant. The supposed training of the form apart from the content has been called *Formal Training*.

The doctrine of Formal Training was implicit in the teaching of the philosophers of ancient Greece. PLATO would have the Athenian youths learn music because such study brought harmony to the soul. ROBERT RECORDE, writing in the sixteenth century, described Algebra as the « whetstone of the witte ». FRANCIS BACON in his decisive manner advocated the study of mathematics because it « maketh a man subtle » and both wit and subtlety were supposed to be available for other material.

It will be remembered that BACON, like a physician, prescribed appropriate studies for the cure of every kind of mental infirmity. The general doctrine of Formal Training, however, was due to the philosophy of LOCKE. His teachings were incorporated into eighteenth century thought and thus the roots of the belief in Formal Training are deep indeed.

The doctrine of faculties resulted in a crude nomenclature that has been responsible for much confusion. Apart from the hypostasis involved in the use of the terms judgment, observation, etc., it is evident that under these categories we may include activities of a vastly different nature. Thus the observation of the artist walking along Oxford Street and enjoying the winter sunset is different from that of a woman seeking bargains in the shop-windows and from that of the taxi driver threading his way through the traffic. But the activity of each of these persons would be described as observation. Yet the advocates of Formal Training have urged that the power to observe is increased by observing, and the power to judge by exercising judgment, thus implying that judging and observing are single activities independent of the material. As the result of many investigations, the general dogma of Formal Training has now been abandoned by modern psychologists although it is recognised that the doctrine contains a certain amount of truth. At the present time, writers on education are cautious enough not to base their arguments on the discredited doctrine.

But the training value or discipline of the subjects of the curriculum has been urged from the moral side. Stern pedagogues have prescribed Latin because of the inherent difficulty of the subject (18). Grammar grind has been insisted on because of the moral value to the pupil as in the old adage : spare the rod and spoil the child. The argument that classical studies owe their peculiar virtues to the intellectual difficulties involved was challenged by HUXLEY. In a delightful passage in which he exposes the follies of an exclusively classical curriculum by a *reductio ad absurdum*, he says :—

«It is wonderful how close a parallel to classical training could be made out of that palaeontology to which I refer. In the first place

(18) T. C. TARVER : *Observations of a Foster Parent*, and W. G. CLARK : *General Education and Classical Studies*.

I could get up an osteological primer so arid, so pedantic in its terminology, so altogether distasteful to the youthful mind, as to beat the recent famous production of the headmasters out of the field in all these excellencies. Next, I could exercise my boys upon easy fossils and bring out all their powers of memory and all their ingenuity in the application of my osteo-grammatical rules to the interpretation or construing of those fragments. « (19)

Although HUXLEY recognises the value of the classics he proceeds to show that the discipline of science may be just as rigorous as that of the classics but that science possesses also a richness of content without which no education can be regarded as liberal.

The evidence given before the many Royal Commissions of the nineteenth century shows that classical headmasters were seriously perturbed over what they considered to be the inadequate discipline of scientific studies. The classical curriculum had a long tradition behind it, and the classicists when they wanted to be rude, said scientific education was an innovation. Schoolmasters clung to a belief in the purely disciplinary value of studies because otherwise they were driven to defend such studies simply on utilitarian grounds. Now the usefulness of any study could be discussed by parents and other laymen and moreover submitted to the test of experience. On the other hand arguments based on the training value of certain studies could never be finally proved true or false. Consequently the upholders of a classical or of a scientific education could each shelter themselves behind barriers of unverifiable opinion. The insistence that studies to be salutary must be difficult reminds us of the nursery dictum that medicine which does us good is always nasty !

The advocates of Science as mental discipline have never gone to such extremes as their classical opponents for the content of science has always compelled attention. But it seems to me that much eloquence has been wasted on the question of the teaching of scientific method. Science masters, while repudiating the merely utilitarian value of their subject have claimed to teach scientific method. It seems as if they agreed with HUXLEY that « all scientific method is one » and that this method, when

(19) *Collected Essays*. III. p. 99.

acquired, can be used to attack problems in other fields. This is but Formal Training in a new guise.

Now the history of science shows that the great discoverers have not employed one simple method in their investigations. Indeed many of the dazzling results seem to have sprung fully armed from the Jove-like brain. If we search in among the works of NEWTON, for instance, we find but a handful of general statements as to his method. The genesis of discovery is an unsolved and indeed insoluble psychological problem. What is commonly called scientific method is the demonstration of the processes of deduction and induction after the discovery has been made or the conclusion formulated. Such demonstrations have their place as intellectual exercises in school-work. But let us not delude ourselves that we are thus initiating our pupils into the methods used by the great men of science in their own processes of thought (20).

Can we justify the teaching of science on the grounds of the mental discipline it affords? Yes, if we realise that mental discipline is something which must come from within and is not a harsh treatment imposed from without. What an individual perceives and understands depends on his experience and mental disposition. If the study of Science is to mean anything more than gestures with a test-tube or the manipulation of a microscope, the pupil must acquire a particular mental disposition by submitting himself to the influence of the great minds of the past. He must lose himself in a greater whole. He will thus learn in a school which represents a tradition of intellectual activity, a school where he must bring his quota if he is to gain the prize.

§ 5. *The Certainty of Science.*

The belief in the inexorable character of mathematics may be traced back to PLATO. During the revival of mathematical studies in the Middle Ages we find a child-like faith in the power of mathematics to interpret the realm of nature. Pythagorean

(20) The possibility of putting a beginner into the position of an original discover is discussed in a valuable work: *The Teaching of Scientific Method.* H. E. ARMSTRONG, London, 1903.

magic and astrological prediction were rife. Then in the post-Copernican period we find KEPLER searching for the mathematical harmonies of the universe and declaring that God had waited since the beginning for an observer.

When we come to the philosophy of DESCARTES we find the most unequivocal assertions about the power and certainty of mathematics. The vision which made him turn aside from the irresponsible ways of youth was of the Angel of Truth who showed him that mathematics is the sole key needed to unlock the secrets of the universe. The correspondence between DESCARTES and MERSENNE (21) shows that he convinced himself that mathematical laws were established by God in the beginning. Since God is perfect and His Will invariable, DESCARTES claimed eternal truth for the conclusions of mathematics. For DESCARTES, there were two worlds, the one a mathematical structure extending in space, the other a world of unextended thinking spirits. This dualism raised the problem of the relationship of mind and body. DESCARTES affirmed that through a part of the brain the unextended mind substance is able to enter into relationship with extended substance, the realm where mathematical certainty reigned supreme. In the Cartesian philosophy the place assigned to this miracle of mind was a relatively subordinate one, its function being merely the discovery of truths already existing in sublime isolation in the external world. This led to the uncritical acceptance of many conclusions and as such had a powerful influence on the subsequent development of scientific thought.

The seventeenth century was marked by a vast growth of empirical knowledge. The experimental method had been preached by FRANCIS BACON and practised according to their own methods by such leaders as GALILEO, TORRICELLI, HARVEY, GILBERT, BOYLE and HUYGENS. With this development of knowledge came a gradual recognition of the limitations of the field of scientific enquiry and a corresponding certainty as to the conclusions of science within that field. With NEWTON, the outstanding figure in this century of science, the great man and the great opportunity appeared together. The supreme physical synthesis of NEWTON and his invention of a new mathematical instru-

(21) *Œuvres*. COUSIN Edition. VI. p. 108.

ment have directed the course of scientific enquiry since his day. In the writings of NEWTON we find a clear distinction between the investigations of empirical science and questions of ultimate causality. Again and again NEWTON repudiates speculative hypotheses so that science becomes for him the exact formulation in mathematical language of the processes of the external world :—

« Whatever is not deduced from the phenomena is to be called an hypothesis ; and hypotheses whether metaphysical or physical, whether of occult qualities or mechanical, have no place in experimental philosophy. » (22)

NEWTON brought the physical phenomena of motion under the sway of mathematical treatment, and thereby introduced a unification into what had hitherto seemed the diverse and disparate laws of heavenly and terrestrial physics. Belief in the simplicity of nature seems inherent in man and possibly led to the universal acceptance of NEWTON's views. To the work of NEWTON following on that of GALILEO, we owe the concepts of mass, force, and momentum. These mechanical concepts were subsequently used in all scientific thought. The customary reliance on the certainty of mathematics led to an unquestioning belief in such physical principles as could be mathematically formulated. The veneration accorded to NEWTON is exemplified in the well-known tribute of LAPLACE that NEWTON besides being the greatest genius was also the most fortunate of men, for since there is only one universe it could fall to the lot of one man only to be the interpreter of its laws.

The entirely new outlook due to the Newtonian philosophy was paralleled to some extent in the nineteenth century by the conception of evolution. But there was a difference. NEWTON's *Principia* was an abstruse work read by few and the absorption of its teachings into the general body of thought was a slow process. The problems raised by the new aspects of biology, however, were not confined to the specialist. The battles of argument could be waged on the open ground of public opinion.

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(22) NEWTON : *The Mathematical Principles of Natural Philosophy* (trans.) 3 vols. London 1803. II., p. 314.

The publication of the *Origin of Species* (1859), was like the declaration of war following a period of distrust and ill-feeling. DARWIN's enunciations showed up clearly the various points of argument on both sides.

With the general acceptance of the newer aspects of biology there arose the attempt to apply these principles to sociological theory exemplified in the writings of HERBERT SPENCER. The principle of evolution was applied by SPENCER indiscriminately to the solution of problems in other fields. Although as a unifying principle the doctrine was of great value, yet it resulted in the later decades of the nineteenth century in an over-simplification of many vast problems and in an unquestioning faith in the conclusions to which it led.

In physical science the unifying principle was the doctrine of energy. The conception of energy had its roots far back in the dynamics of the seventeenth century, but the final formulation of the triumph of the conservation of energy was due to the labours in the nineteenth century of CARNOT, JOULE, KELVIN and HELMHOLTZ. The simplification introduced by this principle was one which could be easily grasped, and which brought with it a feeling of satisfaction and security.

The nineteenth century witnessed the rise and decay of many theories of the ether. THOMAS YOUNG writing in the early years of the century, was convinced that the ether passed freely through material bodies « as the wind through a grove of trees ». KELVIN was led to identify magnetic force with rotation in the ether. MAXWELL posited an ether for the transmission of electro-magnetic effects and this ether he suggested might be identified with the medium required by the wave theory of light. The elastic solid theory of the ether worked out by MACCULLAGH and others seems to have so dominated the imagination of the physicists of the middle nineteenth century that to KELVIN ether was the most certain of realities and to HEAVISIDE the science of electromagnetics was founded upon the observation of « real Newtonian forces, » with ether and energy as the only realities, all else being « moonshine. »

Although some of the conclusions of the newer views on biology were regarded as tentative yet there was absolute certainty as to the pronouncements of physical science. HERBERT SPENCER,

for instance, speaks of exact science as « knowledge which is of the highest order in respect of certainty » and explains that it is distinguished from other knowledge by its « definitely quantitative previsions. » (23) He speaks, too, of the *Principia* as a « system of physical truths. » (24) We have seen how HUXLEY relied on the method of Zadig. Then again in the writings of JOHN STUART MILL we find a reliance on the conclusions and methods of physical science. He goes so far as to say :—

« There is an abstract science of astronomy, namely the theory of gravitation which would equally agree with and explain the facts of a totally different solar system from the one of which our earth forms a part. » (25)

The controvery between TAIT and HERBERT SPENCER (26) on the justification of *a priori* reasoning shows that both antagonists trusted the conclusions of physical science without any criticism of the method by which these conclusions were reached.

Towards the close of the nineteenth century the prevalent idea even in the universities was that the great battle of science was almost won. Certainly the achievements in physical science of JOULE, FARADAY, KELVIN and MAXWELL, the triumph of the doctrine of energy and the enormous development of chemistry and of the applications of science lent some support to this view. There was an air of finality, too, about the two great principles of invariance : the conservation of energy and the conservation of mass. The simplicity and grandeur of these doctrines was such that men felt inclined to sit back in their armchairs and survey with pardonable complacency the achievements of the past. But men of science were not allowed to slumber long. Already there were murmurs of criticism among the philosophers. Nor was it from that source alone that criticism was to come. In the closing years of the century new phenomena were brought to light. In 1895 RÖNTGEN discovered X Rays, a year later HENRI BECQUEREL observed a new kind of radiation from Uranium salts. In 1898 the same type of activity was recognised in the compounds of thorium by the CURIES. Such

(23) *Essays*. III. p. 199.
(24) *Auguste Comte and Positivism*. p. 43.
(25) *Essays*. II. p. 273.
(26) *Nature*. 1874 March 26th to June 28th.

discoveries were startling enough to rouse the soundest sleeper and from that time a new era in the history of Science began.

The Ignorance of Science.

Although professed metaphysicians had long discussed the bases of knowledge, the first critical examination of the assumptions of a particular body of thought by a man of science was made known to the world in 1883 in the *Science of Mechanics* of ERNEST MACH. In this work mechanics is treated not as a branch of mathematics but as one of the physical sciences. MACH investigates the historical development of the main principles of mechanics and so leads to his conception of science as *economy of thought*.

« It is the object of science, » he says, « to replace or *save* experiences by the reproduction and anticipating of facts in thought ... rules for the reconstruction of a great number of facts may be embodied in a *single* expression ..... In nature [for instance] there is no law of refraction. The law of refraction is a concise compendious rule, devised by us for the mental reconstruction of a fact, and only for its reconstruction in part, that is on its geometrical side. » (27)

Thus for MACH the aim of science is not the search for absolute truth whatever that may be, and in freeing science from the entanglements of metaphysics he cleared the ground for the development of a fruitful scientific criticism.

The views of MACH were extended by KARL PEARSON (28) who showed clearly the consequences which follow from the restricted view of science as economy of thought.

« Scientific concepts, » he says, « are, as a rule, limits drawn in conception to processes which can be started but not carried to a conclusion in perception. The historical origin of the concepts of geometry and physics can thus be traced. Concepts such as geometrical surface, atom and ether, are not asserted by science to have a real existence in or behind phenomena, but are valid as shorthand methods of describing the correlation and sequence of phenomena. From this standpoint conceptual space and time can be easily appreciated and the danger avoided of projecting their ideal infinities and eternities into the real world of perceptions. »

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(27) E. MACH. (*Science of Mechanics.*) Eng. trans. London 1893. pp. 481, 485.
(28) K. PEARSON. *Grammar of Science.* London 1892. p. 191.

The work of KARL PEARSON has done much to further the cause of scientific criticism in England.

If we accept the function of science as a description of experience we are free from the old controversies about the outer world. We judge the conclusions of science according as they are consistent within their own field. A scientific law is a generalisation stated by the man of science as a means of summarising his experience. Future generations will use the law as a means for further research or they will abandon it if it is of no use. Thus the so-called laws of nature are made by man.

The pronouncements of science are limited to the particular range of experience covered, they are no statements as to universal truth but are merely supposals : if so and so happens then so and so follows. This particular view of science was recognised so long ago as 1867 by KEKULÉ, who in a discussion on the atomic theory said :—

« The question whether atoms exist or not has but little significance from a chemical point of view, its discussion belongs rather to metaphysics... from the philosophical point of view I do not believe in the actual existence of atoms... As a chemist, however, I regard the assumption of atoms not only as advisable but as absolutely necessary... *Whether matter be atomic or not, this much is certain that granting it to be atomic, it would appear as it now does.* » (29)

We have seen how during the centuries in which mathematics was the only established science, no doubt was ever cast upon the certainty of mathematical conclusions. Geometrical propositions were regarded as eternal truth and divine in their origin. Until the early part of the nineteenth century mathematics was regarded as *a priori* knowledge and the other sciences became self-respecting as soon as they were on good terms with mathematics. But gradually it was realised that Euclidean geometry is but one out of many possible geometries. That of EUCLID simply fits in with the state of things to which we have been accustomed from our early childhood.

The non-Euclidean geometries have been used in the theory of Relativity which entered the arena of public discussion during

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(29) Quoted in I. FREUND. *Study of Chemical Composition*. Cambridge 1904. p. 624.

the period 1910-1920. According to the principle of relativity the world is not three dimensional, but a four dimensional continuum. The elaborations of this hypothesis show us that this four dimensional world is analysed into space and time differently according to the state of motion of the observer and that the Newtonian law of gravitation is no longer tenable in its original form. It follows, too, that absolute motion has no physical meaning and that no velocity exceeding the velocity of light can be observed. Consequently there can be no instantaneous action at a distance.

Our traditional assumptions require examination, and no teacher of science should shirk the duty of adopting some answer to the questions raised by modern scientific criticism. In our acknowlegdement of the ignorance of science may we place any reliance in its predictions? A noble array of scientific prophecies at once comes to mind, the classic example of HALLEY's comet, the discovery of Neptune by ADAMS and LEVERRIER, CLERK MAXWELL's prediction of electro-magnetic waves, and the syntheses of complex carbon compounds worked out with the aid of structual formulae before their preparation in the laboratory. Such predictions are examples of what NUNN aptly calls the *intellectual control* which science gives. Scientific knowledge is a structure of concepts and a description of phenomena in terms of those concepts. Within the boundaries thus marked out, science can predict and its conclusions are consistent.

Even when the conceptual instruments are at fault, the results obtained may be of value. Thus the caloric theory in the hands of BLACK led men to regard heat from a quantitative standpoint, and so to arrive at important numerical results. The same caloric theory was held by CARNOT but his investigations in thermodynamics when further elaborated led to the enunciation of one of the most fruitful generalisations in physical science. At the present time the physicist chooses his conceptual instruments according to the particular problem in hand. Thus in discussing the phenomena of double refraction in crystals he uses the suppositions of the elastic solid theory of the ether. He adopts the wave theory of light in describing the phenomena of interference. But he uses the quantum theory to account

for the distribution of energy in the spectrum of a black body. Yet the wave theory and quantum theory as they stand at present are irreconcilable.

These considerations lead us to take a pragmatic view of scientific truth. We will use conceptual methods which work and refrain from any pronouncements as to final truth and certainty. As HEAVISIDE once said

« A physicist may employ unrigorous processes with satisfaction and usefulness if he, by the application of tests assures himself of the accuracy of his results. » (30)

Thus the test applied is simply the criterion of usefulness.

The progress of science involves continual change. Old theories that have outworn their usefulness have to be discarded. Syntheses have to be broken up, analysed afresh with the help of new knowledge, then built up into syntheses simpler than the first. The process is a kind of intellectual metabolism. In the past there have been periods when the progress of science seemed to be but the steady acquisition of knowledge and the consolidation of fundamental principles. Then there have been periods of warfare, with the clash of divergent opinions which have resulted in profound changes in outlook and method. Throughout these changes science has progressed by making her own weapons and her own plan of attack by which she has conquered vast territories from the region of the unknown.

(University College, London.) D. M. TURNER.

(30) O. HEAVISIDE. *Electromagnetic Theory*. 3 vols. London 1899. II, p. 9.

Medallic Illustrations of the History of Science

(First series: XIXth and XXth centuries)
Third Article.

The first two instalments appeared in *Isis*, vol. VIII, p. 333-335, pl. 17-20, 1926, and vol. IX, p. 359-362, pl. 13-16, 1927. The Editor will welcome photographs or suggestions for the following parts of this series. It is intended to publish only medals having a sufficient scientific and artistic interest. Medals dedicated to scientists who are still living can not be published at once but will be considered for ulterior publication.

GEORGE SARTON.

No. 13. (JULES) HENRI POINCARÉ. Born in Nancy, Meurthe et Moselle, 1854; died, Paris, 1912. French mathematician, physicist, astronomer, philosopher.

Notice sur ses travaux scientifiques. 73 p. Paris 1886. — ERNEST LEBON. H.P., biographie, bibliographie. 88 p. Paris 1909 (2e éd. 115 p., 1912). — EDOUARD TOULOUSE. H.P. (Enquête médico-psychologique) 210 p. Paris 1910. — GEORGE SARTON. H.P. *Bull. de la Société belge d'astronomie*, t. 34, 1-11, 37-48, 1913 (containing some biographical facts not published elsewhere). — ROBERT D'ADHÉMAR. H.P. 63 p. Paris 1914. — GASTON DARBOUX. Eloge historique. *Mémoires de l'Académie des Sciences*, vol. 52, 1914. — VITO VOLTERRA, JACQUES HADAMARD, PAUL LANGEVIN, PIERRE BOUTROUX. H.P. Paris 1914.

(I may be permitted here to recall that POINCARÉ was the first patron of *Isis*, but he died before the publication of the first number; his portrait forms the frontispiece of the first volume.)

See also *Isis* I, 95-7, 172-3, 310, 311, 719, 791; II, 451; III, 119; IV, 169; V, 237, 256, 292, 519.

Artist: GEORGES HENRI PRUD'HOMME. French medallist; born in Cap Breton, Landes.

Size: 70 × 70 mm. *Collection:* G.S.

Nr. 13. Fig. 17, 18. Henri Poincaré.

No. 14. Fig. 19 — J. B. DUMAS.

No. 15. Fig. 20. — C. HANSTEEN.

No. 16. Fig. 21. — Louis Agassiz.

No. 17 Fig. 22. Lord Kelvin.

Publisher: Fondation Henri Poincaré, Académie des Sciences Paris (See *Isis* II, 398).

Obv. HENRI POINCARÉ. MDCCCLIV-MDCCCCXII. Portrait (fig. 17). *'Αρμονίη ἀφανὴς φανερῆς κρείττων* (meaning, the invisible harmony is greater than the visible one.) G. PRUDHOMME.

Rev.: (fig. 18). Académie française. Académie des Sciences. A HENRI POINCARÉ. Mathématicien. Philosophe. Physicien. Astronome. 1854-1912. Souscription internationale.

No. 14. JEAN BAPTISTE (ANDRÉ) DUMAS. Born in Alais, Gard, 1800; died in Cannes, 1884. French chemist. Theory of substitution (older type theory). Determination of vapor densities and its application to the measurements of atomic weights. Development of organic chemistry.

Biography by PH. VAN TIEGHEM in *Mémoires de l'Académie des Sciences*, vol. 52, Paris 1914. — ARMAND GAUTIER. Inauguration de la statue de DUMAS. 49 p. Paris 1889.

See also *Isis* I, 771; II, 277, 279; V, 240.

Artist: ALBERT DÉSIRÉ BARRE (1818-78) French medallist.

Date: 1873. *Size:* 61 mm.

Collection: G.S.

Publisher: Monnaie, Paris.

Obv.: Portrait (fig. 19.)

Rev.: Professeur J.B.A. DUMAS. Secrétaire perpétuel de l'Académie des Sciences. Grand-croix de la Légion d'honneur. Vice-président du Conseil supérieur de l'Instruction publique. Ancien ministre de l'agriculture et du commerce. Ancien président de la commission des monnaies.

No. 15. CHRISTOPHER HANSTEEN. Born in Christiania, 1784; died there in 1873. Norwegian astronomer and physicist. He devoted the greatest part of his activity to the study of terrestrial magnetism.

Artist: B. BERGSLIEN. Norwegian medallist, active c. 1818-56.

Date: 1856. *Size:* 38 mm.

Collection: Numismatic Cabinet of the University of Oslo. Communicated by Dr. HANS HOLST, Oslo.

Obv.: CHRISTOPHORO HANSTEEN. Portrait (fig. 20.)

Rev.: (Branches of oak and laurel). Splendet in orbe decus.

Solennia semisecularia gratulatur, Univ. Reg. Fred. MDCCCLVI.

No. 16. (Jean) Louis (Rodolphe) Agassiz (born at Mortier, Lake Morat, Switzerland, 1807; died in New York, 1873). Swiss zoologist and geologist. Fresh-water fishes of Central Europe; fossil fishes. Fossil mollusks. Glacial theory (1840). Nomenclator zoologicus (1842-46). Bibliography of zoology and geology.

Elizabeth Cary Agassiz. Life and correspondence of Agassiz. 2 vol. Boston 1885. — Charles Frederick Holder. Agassiz. New York 1893. — Jules Marcou. Life, letters and works of L.A. 2 vol. New York 1896. — Alice Bache Gould. L.A. (Beacon biographies) Boston 1901. — Maurice de Tribolet. L.A. et son séjour à Neuchâtel de 1832 à 1846. 40 p. Neuchâtel. 1907. — Lane Cooper. L.A. as a teacher. IX + 74 p. Ithaca, N.Y., 1917.

Artist: Fritz (Ulysse) Landry. Swiss medallist. Born at Le Locle in 1842. (This medal is one of his best).

Size: 90 mm. *Collection:* American Numismatic Society, New York. Communicated by Mr. Howland Wood, New York.

Obv.: L. Agassiz, 1807-1873. (Portrait, fig. 21). F. Landry. Neuchâtel, Suisse.

Rev.: Viro ingenio labore scientia praestantissimo.

No. 17. Kelvin. Sir William Thomson, first and last Baron Kelvin of Largs (1892). Born at Belfast, 1824; died at Netherhall, near Largs, Scotland, 1907. English physicist and inventor. One of the organizers of thermodynamics. He was largely responsible for the successful laying of the first Atlantic cable (1866). Electrical measurements and standards. Mirror galvanometer, siphon recorder, electrometer, mariner's compass. New method of flying soundings. Tide gauge, tide harmonic analyser and tide predicter.

Andrew Gray. Kelvin. London, 1908. — Elizabeth (Thomson) King. Lord Kelvin's early home, being the recollections of his sister..... XII + 245 p., illust., London 1909. — Silvanus Phillips Thompson. Life of Kelvin. 2 vol. London 1910. — David Wilson. Kelvin, his way of teaching natural philosophy.

56 p. Glasgow 1910. — EMILE PICARD. Notice sur KELVIN. 39 p. *Mémoires de l'Académie des Sciences*, Paris, 1919. — DAVID MURRAY. KELVIN as professor in the old College of Glasgow. 22 p., portrait, Glasgow 1924.

Artist: JOHN H. PINCHES. English medallist and die-sinker, born in 1852.

Size: 52 mm. *Collection:* American Numismatic Society, New York. Communicated by Mr. HOWLAND WOOD, New York.

Obv.: WILLIAM THOMSON. BARON KELVIN, O.M. (Portrait, fig. 22).

Rev.: Founded by Engineers, 1914. In memory of BARON KELVIN OF LARGS, engineer and natural philosopher. Born 1824, died 1907.

No. 18. RUDOLF VIRCHOW (Born at Schievelbein, Pomerania, 1821; died in Berlin, 1902). German pathologist, anthropologist, archaeologist; historian of medicine. Founder of the *Archiv für pathologische Anatomie und Physiologie*, 1847. Father of modern (cellular) pathology (Cellular-Pathologie, Berlin, 1858).

Biographies by WOLF BECHER. Berlin 1891. — J. PAGEL. Leipzig 1906. — JULIUS SCHWALBE. VIRCHOW-Bibliographie, 183 p. Berlin 1901. — Briefe VIRCHOWS an seine Eltern, edited by MARIE RABL. Leipzig 1907. — WILHELM WALDEYER. Gedächtnissrede. *Preuss. Akad.*, 52 p. Berlin 1903.

Artist: ANTON SCHARFF. Austrian medallist; one of the greatest medallists of our times. Born in Vienna, 1845; died at Brünn in 1903.

Date: 1891. *Size:* 175 mm.

Collection: American Numismatic Society, New York. Communicated by Mr. HOWLAND WOOD, New York.

Obv.: RUDOLPHUS VIRCHOW Pomeranus civis Berolinensis. Aetat. LXX (portrait, fig. 23). A. SCHARFF.

Rev.: Omnis cellula e cellula (fig. 24).

Notes and Correspondence

Queries and Answers

Edited by TENNEY L. DAVIS (Mass. Institute of Technology, Cambridge, Mass.)

Query 5. En lisant *Isis* (vol. VIII, 355) j'ai été frappée par la phrase suivante d'un compte-rendu de M. WIELEITNER consacré à l'ouvrage de M. ADICKES, *Kant als Naturforscher* : « Diese (Ausarbeitung) führte ihn aber zu einer näheren Untersuchung der naturwissenschaftlichen Teils des sog. « Opus postumum », einer bisher noch nicht gedruckten (auch nicht druckfertigen) Handschrift KANTS mit dem Titel « Uebergang von den metaphysischen Anfangsgründen der Naturwissenschaft zur Physik » (die als letzter Band der grossen Kantausgabe nun doch noch erscheinen soll). »

Or, j'ai eu occasion, il y a quelques jours, de consulter un ouvrage de KANT que M. MEYERSON cite à plusieurs reprises dans son ouvrage «Identité et réalité» *(Isis, IX*, 467*)* : — Das Nachgelassene Werk IMMANUEL KANTS « Vom Uebergange von den Metaphysischen Anfangsgründen der Naturwissenschaft zur Physik » mit Belegen populär-wissenschaftlich dargestellt von ALBRECHT KRAUSE. Frankfurt a.M., Schauenburg, 1888, in-8°. XVII + 213 p.

La similitude des deux titres qui ne diffèrent que par un mot cache-t-elle deux ouvrages différents ? ou s'agit-il de la même œuvre ?

HÉLÈNE METZGER (*Paris*).

Answer 5. Was die Anfrage der Mme. H. METZGER betrifft, so hätte man aus dem Titel von KRAUSES Werk schon entnehmen können, dass es sich dabei um eine populärwissenschaftliche Darstellung von KANTS Opus postumum handelt, allerdings mit Belegen (auf den linken Seiten des Werkes, während auf den rechten Seiten die Darstellung steht). Etwa zwei Drittel des Opus postumum sind schon von R. REICKE in der *Altpreussischen Monatsschrift* edirt. Das ganze Werk soll am Schluss von KANTS handschriftlichem Nachlass in der Kantausgabe der Berliner Akademie zum ersten Mahl herauskommen. Ueber alles einzelne unterrichtet mein Werk : « Kants Opus postumum dargestellt und beurteilt », 50. Erg. Heft der Kantstudien, 1920, 855 S.

ERICH ADICKES (*Tübingen*).

Query 6. The latter part of ROGER BACON's treatise *De Mirabili Potestate Artis et Naturae* describes in obscure language the purification of saltpeter and the preparation of black powder, and prescribes twice, in enigmatic language and in an anagram, the precise composition of the mixture. Because of an apparent difference of style, a difference which may well be due to the difference of subject matter or to the difference in the mode of treatment, it is often supposed that the latter part of the treatise is a later addition and was not written by the author of the principal treatise, whether ROGER BACON or not. The reference, toward the end, to the Three Contraries indicates that the author was acquainted with mysteries which were ancient and long hidden, mysteries which were symbolized for the initiate by the winged Babylonian Sphinx. The treatise closes with the proposition — « Whoever will rewrite this will have a key which opens and no man shuts, and when he will shut, no man opens. » This is indeed prophetic as regards black powder, but it also is closely similar to a passage of the book of Revelation — « And to the angel of the church in Philadelphia write ; These things saith he that is holy, he that is true, he that hath the key of David, he that openeth, and no man shutteth ; and shutteth, and no man openeth. » The fact that this passage is the *seventh* verse of the *third* chapter can be no mere coincidence. Who, contemporary with ROGER BACON or soon thereafter, was deep enough in Christian and in Pagan mysteries to write these things?

TENNEY L. DAVIS.

Query 7. — *Measurement of mountain altitudes.*

When, where, and how did exact measurement of the altitude of mountains, by scientific method and on a cooperative basis, begin? My curiosity has been excited on this point by a passage in the works of ROBERT BOYLE (1627-1691), in which he discusses the height of mountains in general and that of the Pic of Teneriff in particular. This passage occurs in the edition of BOYLE's works of 1772 in vol. III, pp. 225-228, in *A Continuation of New Experiments Physico-Mechanical, touching the Spring and Weight of the Air*, dated Oxford, March 24, 1667 : Experiment XXIII, « Confirming that mercury in a barometer will be kept suspended lower at the top than at the bottom of a hill. On which occasion something is noted about the height of mountains, especially the pic of Teneriff. »

BOYLE begins, « Perhaps I told your Lordship already by word of mouth, that I have been solicitously endeavouring to get the Torricellian experiment tried upon the pic of Teneriff : but hitherto I have had no account of the success of my endeavours. » He then states that KEPLER and « diverse late mathematicians will not allow above two miles... to

the height of the highest mountain, » and some of them not half as much. But he has talked with credible persons who have been on the tops of very high mountains, notably the Pic of Teneriff in the Canary Islands, and who have given him quite a different estimation. It must be higher than KEPLER and other mathematicians allow, since it can be seen at sea from 120 to 180 miles away. RICCIOLUS and SNELLIUS calculated its height as ten miles supposing it to be visible at sea four degrees off. RICCIOLUS also estimated the altitude of Mount Caucasus as 51 Bolognese miles — which are somewhat longer than Roman miles — on the basis of an obscure passage in ARISTOTLE who, however, « sometimes takes up reports upon hearsay without over-strictly examining their truth or probability. » But all the navigators and travelers whom BOYLE has met, and he has had the opportunity of meeting many, have almost unanimously agreed that the Pic of Teneriff is the highest mountain known ; « and yet that it is so far from being fifteen leagues high, as some eminent and even late writers would persuade us, that it is scarce one-seventh part so high as RICCIOLUS computes Mount Caucasus to be. » In other words, BOYLE estimates its height at about seven miles, whereas really it is only 12,182 feet. He adds, « We have since endeavoured, but without yet knowing what will be the success, to have the height of this mountain carefully taken by skilful men. »

There seems, however, to be no further allusion to the outcome of this attempt in BOYLE's subsequent writings. In *The General History of the Air*, left unfinished at his death in 1691, he repeats the estimate of seven miles for « the perpendicular height of the hill » on the basis of the distance at which it could be seen at sea (*Works*, V, 706-707), although he also states (*Ibid.*, p. 703), « The whole altitude of the *Pico* in perpendicular is vulgarly esteemed to be two miles and a half. » This last estimate, so close to the truth, furnishes one more instance from the past of common experience supplying more correct information than philosophic writings.

PASCAL's experiments of 1648 suggested a new method of measuring altitudes. BOYLE was acquainted with these experiments and requested TOWNLEY to repeat them in Lancaster. Within BOYLE's lifetime EDMUND HALLEY published in the *Proceedings of the Royal Society* (vol. XVI, May, 1686, pp. 104-116) a paper which may be called the foundation of the barometric method. Of course it took more than a century to bring that method to a sufficient degree of perfection. But the question is : when was it first applied to actual measurements for cartographical purposes and by whom ?

(*Columbia University, New York.*) LYNN THORNDIKE.

II. Miscellanea.

Sir Isaac Newton's Bi-Centenary. — *The History of Science Society*, in collaboration with committees from the *American Mathematical Society*, *Mathematical Association of America*, *American Astronomical Society* and the *American Physical Society*, proposes to commemorate the 200th Anniversary of the death of Sir ISAAC NEWTON by an appropriate program at Columbia University, New York, November 25 and 26, 1927.

On this occasion it is planned to have addresses relating to the great contributions of NEWTON to the advancement of mathematics, astronomy and physics, and setting forth his interests in chemistry, chronology, theology and other branches of learning. It is also hoped that some reference will be made to NEWTON's early contribution to the advancement of science in the American Colonies — when Harvard and Yale Colleges were in their infancy. Each subject will be represented by at least two papers given by scholars of distinction.

It is proposed to have a large exhibition of *Newtoniana*, including the first edition of the Principia, and other related publications, also portraits, medals and autographed letters and documents, and such material as bears directly upon his life, achievements and contemporaries. Therefore it is hoped that those who have material of this nature will take pleasure in loaning it to the committee in charge of the exhibit; it is requested that those who can contribute will communicate as soon as possible with the Secretary.

Similar commemorative programs have already been held on the anniversary date of NEWTON's death, namely, March 20, by various societies and universities of this country, and also in England. *The History of Science Society* will take the opportunity to honor NEWTON, at its regular annual meeting.

A full program of papers and speakers with other particulars will be published in *Science* during October.

The following individuals form the Program Committee : For the *History of Science Society*, Dr. DAVID EUGENE SMITH (Chairman), Columbia University. Dr. HENRY CREW, Northwestern University. For the *American Mathematical Society*, and *Mathematical Association of America*, Dr. R. C. ARCHIBALD, Brown University. Dr. E. W. BROWN, Yale University. Dr. FLORIAN CAJORI, University of California. For the *American astronomical Society*, Dr. E. W. BROWN, Yale University. For the *American Physical Society*, Dr. LEIGH PAGE, Yale University.

Library of Congress,
Washington, D. C.

FREDERICK E. BRASCH.
Secretary of the Committee.

Sudhoff Medals. — The first annual award of two Sudhoff medals was made at the meeting of the « Deutsche Gesellschaft für Geschichte der Medizin und der Naturwissenschaften » which took place on Sept. 22, 1926, in Düsseldorf. The Sudhoff medal is, I believe, the greatest honor which a historian of science may hope to obtain today. It is more important than the Prix Binoux awarded by the French Académie des Sciences since 1903 (*Isis*, VIII, 161-163), because the Sudhoff medal is given by a committee of experts, while the Binoux prize is generally given by a committee of men, who however eminent in other spheres, are not professional historians of science : it is as if a prize of botany was awarded by a group of distinguished mathematicians, or a prize of chemistry, by astronomers. The very fact that the ludicrousness of such incompetent awards is not generally realized is a sufficient proof of the contempt in which our studies are held by the average men of science. These remarks may seem a little ungracious from the part of one who received the Prix Binoux a few years ago : Amicus Plato sed magis amica veritas.

To return to the Sudhoff medals. The first two were awarded to the historian of epidemiology, GEORG STICKER of Würzburg, and to the historian of chemistry, EDMUND O. VON LIPPMANN of Halle, both, especially the latter, well known to our readers.

The official terms of each award were as follows :

Für Herrn GEORG STICKER :

Es gereicht der Gesellschaft zur besonderen Freude, dem Danke, den die medizingeschichtliche Forschung Ihnen, hochverehrter Herr Kollege, schuldet, in dieser Form Ausdruck geben zu können. Er gilt nicht nur dem ausgezeichneten Kenner aller Entwicklungsphasen der Medizin, dem umsichtigen und tiefdringenden Erforscher der grossen Volksseuchen, dem glänzenden und geistvollen Schriftsteller, er gilt auch Ihrer vorbildlichen ärztlichen Persönlichkeit, dem Vertreter einer feinen Humanismus, dem lauteren, unbeugsamen Charakter.

Für Herrn EDMUND O. VON LIPPMANN :

Die Gesellschaft gedenkt an diesem Tage mit Dank und Bewunderung der Arbeiten zur Geschichte der Naturwissenschaften und insbesondere der Chemie, die Sie neben Ihrem alle Kräfte eines Mannes erfordernden Hauptberufe veröffentlicht haben. Zwischen dem Erscheinen der Geschichte des Zuckers, mit der Sie Ihren Ruf als Historiker der Chemie begründeten, und der Darstellung der Entstehung und Ausbreitung der Alchemie liegt ein Zeitraum von nahe zu dreissig Jahren, von denen kaum eines ohne wertvolle geschichtliche Studien blieb. Welche Wirkungen von Ihrer meisterhaften Geschichte der Alchemie ausgegangen sind und noch ausgehen, ist uns allen gegenwärtig. In der gewissenhaftesten Verwertung der Quellen, der restlosen Erfassung alles zugänglichen Stoffes, der geistvollen Darstellung sind Sie allen Fachgenossen ein leuchtendes Vorbild geworden. » G. S.

Scientia. — La revue *Scientia* (*Rivista internazionale di sintesi scientifica*), dont le nom revient très souvent dans nos bibliographies critiques, fête cette année 1927, avec son 41e volume, sa vingtième année

d'existence. Elle a été fondée en 1907 par G. BRUNI, A. DIONOSI, F. ENRIQUES, A. GIARDINA, et E. RIGNANO.

Son caractère international s'est immédiatement marqué par l'emploi des quatre langues fondamentales qui sont aussi celles d'*Isis* : allemand, anglais, français et italien (*Scientia* a aussi publié quelques articles en espagnol); tous les articles non publiés en français étant cependant traduits dans cette langue, comme c'est encore le cas à l'heure actuelle, dans un supplément qui accompagnait chaque fascicule trimestriel. En même temps, la volonté de ses fondateurs d'en faire un organe de synthèse était nettement posée par un avertissement aux auteurs dont j'extrais les lignes suivantes : « le comité de direction se réserve la faculté d'établir par avance le programme des questions à étudier et de répartir le travail entre ses éminents collaborateurs afin d'assurer à la revue l'unité organique qui ne serait pas réalisable si l'on acceptait des articles sur des sujets disparates, sans aucun lien entre eux, fussent-ils dûs à la plume de savants d'une valeur incontestable ». (A vrai dire, cette unité n'est pas toujours apparue).

Chaque fascicule était, et est encore composé d'articles de fond, d'analyses critiques (celles-ci toujours publiées en français, mais en un français parfois douteux), d'une revue des revues, et d'une chronique. Je relève au premier fascicule, comme signataires d'articles originaux, les noms de E. PICARD, W. OSTWALD, G. CIAMICIAN, F. RAFFAELE, H. E. ZIEGLER, C. SUPINO, W. CUNNINGHAM et J. TANNERY, traitant des questions de mécanique, d'énergétique, de chimie, de biologie, d'économie politique, d'histoire et de pédagogie. En 1912, de trimestrielle, la revue devenait bimestrielle; elle est maintenant mensuelle et s'abrite Via A. De Togni, 12, Milano, 116.

Plus heureuse que bien d'autres périodiques, *Scientia*, à qui les pouvoirs pubics italiens, et même le monde des affaires s'étaient rapidement intéressés, a pu continuer à paraître pendant la guerre (sous la seule direction d'EUGENIO RIGNANO depuis Juillet 1915), mais sans la collaboration des savants de langue allemande, laquelle n'a été reprise qu'en 1924.

En se reportant à nos bibliographies critiques, on verrait qu'elle a publié entre autres une enquête qui a duré plus de deux ans sur le mécanisme et le vitalisme en biologie, de nombreuses études sur la relativité, sur les nouvelles théories astronomiques, sur les théories de l'atome, sur les sciences grecques et leur transmission, sur l'histoire des mathématiques, etc., etc. et sur les questions brûlantes d'économie politique. Depuis vingt ans, *Scientia* a bien servi le monde de la pensée libre, a bien mérité de l'esprit philosophique. *Isis* est heureuse de lui souhaiter longue vie encore dans la voie qu'elle s'est tracée et dont elle ne s'est pas écartée.

L. GUINET.

Reviews

Arnold C. Klebs und **Karl Sudhoff.** — *Die ersten gedruckten Pestschriften.* — **A. C. Klebs.** Geschichtliche und bibliographische Untersuchungen ; **K. Sudhoff,** Der Ulmer Stadtarzt und Schriftsteller HEINRICH STEINHÖWEL. 264 S., mit Abbildungen im Text, 24 Tafeln und Faksimile von STEINHÖWEL's Büchlein der Pestilenz, Ulm, 1473. München, Münchner Drucke, 1926.

This is a very welcome contribution to the history of medicine in the second half of the XVth century. Dr. KLEBS, of Nyon (near Geneva) to whom we owe already many important studies on scientific incunabula (see e.g. *Isis*, III, 101 ; VI, 153 ; VII, 198) gives us now a list of plague tracts, which has been compiled with considerable care and accuracy. Considering Dr. KLEBS' deep acquaintance with the subject, his close contact with the leading experts of many countries, and the fact that he was able to consult the archives of the « Gesamtkatalog der Wiegendrucke », we may assume that his list is as nearly complete as possible.

It registers about 145 editions, including variants. A total of forty authors are represented, 30 of them being contemporaries, the others belonging chiefly to the XIVth century. However, the older authors were far more popular ; though they formed only one quarter of the total number, the editions of their works constitute almost one half (67) of the whole series. This is not very surprising, as it took much longer then than now to build up a reputation or to lose one already well established. Moreover, the contemporaries were not necessarily more modern than their elders ; all of them, young and old, drew largely from the same sources, chiefly from the corpus of Arabic medicine. Innovations were introduced by and by but only in homeopathic quantities.

It is interesting to note that as far as printing places are known, these incunabula are distributed as follows (for each country I give the names of the cities where more than five editions appeared). Germany and Austria, 70 (Augsburg 17, Cologne 10, Nürnberg 7, Leipzig 6) ; Italy, 35 (Rome 9, Venice 9, including 5 editions of KETHAM's *Fasciculus*, for which see *Isis*, VI, 547 ; VIII, 350) ; Low Countries, 9 (Antwerp 8) ; Spain and Portugal 7 ; England 3 ; Switzerland (Basel and Geneva), 3. The most striking facts are the predominance of Germany and, among cities,

of Augsburg and Cologne, and the absence of Scandinavian editions.

As far as I could judge, more than half (c. 75) of these tracts were written in Latin, the other languages being represented as follows : German, Low German and Dutch, 47 ; French 10 ; Italian 8 ; Spanish, Catalan, Portuguese, 7 ; English 3. This rough classification is sufficient to prove the great superiority of German over other vernaculars in this particular respect. I must still add that in my statistical summaries I have considered all of these editions as equivalent, which is far from true but is perhaps sufficient for a first approximation.

The tracts are classified in alphabetical order of authors, each being briefly but very clearly described from the bibliographic standpoint ; this is followed by a chronological list and by a list in alphabetical order of printing places. Hence any query relative to these tracts can be very easily answered. However this is only a sort of introduction which is followed by a deeper study of various groups of these incunabula.

The study of these tracts, many of which were very humble, is interesting because it often marked the beginning of the activity of a medical printer. Leaving aside the broadsheets, sermons, prayers and similar documents, it is interesting to note that these early prints, even those written in the vernacular, were meant not for the general reader but for physicians. Most of them were derived from IBN SÎNÂ's theory of fevers (prima fen quarti Canonis AVICENNAE). I may recall that the Latin Canon had been printed in Milano, 1473 and GENTILE DA FOLIGNO's commentary on the theory of fevers had appeared in Padua, 1476 ; I may recall also that medical printing proper did not begin anywhere before the seventies (1).

The earliest printed tract dealing partly with the plague was the Ordnung der Gesundheit (Aristoteles-Alexander Brief, Regimen sanitatis zu Deutsch), printed by JOH. BÄMLER in Augsburg, April 22, 1472. Three other German Regimens appeared in Nürnberg and Augsburg in that same year. However the first plague treatise proper was STEINHÖWEL's *Büchlein der Ordnung der Pestilenz* (Ulm, Jan. 11, 1473), of which there are not less than seven incunabula editions. It is not the place here to follow the author in his learned discussions, largely centered upon bibliographical details, but it is useful to state that some of his notes are specially devoted to the following authors (the figures following each name indicate the number of editions bearing that name) : PIETRO DA TOSSIGNANO (6) ; GENTILE DA FOLIGNO (3) ; CANUTUS (Episcopus Arusiensis, ? BENGT KNUTSSON, d. 1462) ; JOHANNES JACOBI (JEAN

(1) See Sir WILLIAM OSLER. Incunabula Medica 1923 : (no. 6) GUGLIELMUS DE SALICETO. De salutate corporis (Holland, c. 1470) ; (No. 7) ALBUCASIS. Liber servitoris (Venice, 1471). See also KLEBS, 1924 (*Isis* VII, 198).

JASME, d. 1384) — 27 editions classified under CANUTUS plus 6 under JACOBI ; VALESCUS DE TARENTA (15).

The most popular of these writings was the *Regimen* ascribed to the mysterious CANUTUS, which was actually composed by JOHANNES JACOBI ; this was proved by SUDHOFF in his « Pestschriften seit 1348. » The most important writing was by all means the earliest one. The second part of this excellent volume, contributed by KARL SUDHOFF, is devoted to this work and its author (p. 169-215). The Swabian HEINRICH STEINHÖWEL, born in 1412, obtained his M.D. in Padua, 1443, then returned to Germany ; he was appointed town physician of Ulm in 1450 and died in 1478 (not 1482). He was one of the earliest German humanists and was chiefly known for his translations of various moralizing works from Latin into German : AESOP (2), APOLLONIOS OF TYRE, BOCCACCIO (*Griselida*, *De mulieribus claris*), etc. SUDHOFF gives abundant information on these translations and then proceeds to analyze and discuss the famous Büchlein der Ordnung of 1473. The sources of the Büchlein were still overwhelmingly Arabic (3). The analysis of the Büchlein is completed by a glossary, and the Büchlein is entirely reproduced in fascimile (80 p.) at the end of the book. Twenty four additional plates reproduce title pages and colophons of other plague tracts and of other works of STEINHÖWEL.

Though this review is already too long I must still say a few words of the admirable introductory essay written by Dr. KLEBS and dealing with incunabula in general and the best methods of approaching them. This is a very wise contribution to the subject, putting incunabula studies in their proper place with sufficient emphasis on both sides of these studies, the bibliographic or technical and the literary or philosophic. Both points of view are necessary, neither is sufficient. While greatly admiring the labor of the German commission in charge of the « Gesamtkatalog der Wiegendrucke », he does not hesitate to criticize it. They seem to elaborate their catalogue over much and thus (unless they change their method) the complete work will fill not ten but thirty volumes and be brought to an end only by 1955 (4). « Le mieux est l'ennemi du bien ». The German commission is perhaps right after all,

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(2) The *Æsop* (1476 or 1477) was immensely successful. No illustrated incunabula obtained as much success except of course the lives of the saints.

(3) Seven Arabic writers are quoted, in all 23 times ; three Greek writers (HIPPOCRATES, ARISTOTLE, GALEN) are quoted in all 6 times, but of these three, ARISTOTLE represents really an Arabic writing (the dietetic letter to ALEXANDER). Thus there are 26 Arabic against 3 Greek quotations; 14 of these 26 quotations refer to IBN SÎNÂ.

(4) In March 1920, there were already 37639 descriptions of incunabula. The only volume thus far published, (Leipzig 1925) contains 1256 titles.

but we must reconcile ourselves with the idea that their work is not done for us, but rather for the next generation. In the meanwhile such monographs as this, dealing with a definite group of incunabula, are exceedingly valuable ; they may be considered either as first class contributions to the greater undertaking or else as bibliographic introductions for the use of definite groups of specialists, — in the present case, historians of medicine. KLEBS insists rightly upon the special importance, from the cultural point of view, of the first editions ; these editions were frequently the best of the early editions. This introduction which covers only 13 p. and appeals to a larger circle of readers than the rest of the book ought to be translated into English.

To sum up, this is an excellent book in every respect, beautiful and pithy, full of substance, honest, —the real thing.

GEORGE SARTON.

Ioannes Baptista Canano (1515-1578) (1). Girolamo da Carpi (1501-1556). — ***Musculorum humani corporis picturata dissectio*** (Ferrara, 1541 ?). Facsimile edition annotated by HARVEY CUSHING and EDWARD C. STREETER. (Monumenta Medica IV. under the general editorship of HENRY E. SIGERIST). 98 p. Florence, Lier, 1925 ($ 3).

This handsome facsimile edition is supplemented by a list of the extant copies (eleven in number) compiled by A.C. KLEBS and is introduced by two exceedingly well written essays. The first, contributed by HARVEY CUSHING (q. v., *Isis*, VIII, 358-361), is devoted to an interesting comparison between three early works of anatomical interest : VESALIUS' Six anatomical tables, Venice, 1538 (*Isis*, IV, 410), CANANO's Dissection, Ferrara, 1541 ?, and SERVETUS's Christianismi restitutio, Vienna, 1553. The second essay is biographical ; it is based to some extent upon VIRGILIO DUCCHESCHI's study (in MIELI's Scienziati italiani, 1923, *Isis*, VII, 336), but charmingly written, by EDWARD C. STREETER.

GIAMBATTISTA CANANO was born at Ferrara in 1515 (in the same year as VESALIUS) ; twenty six years later he succeeded his uncle ANTONIO MARIA CANANO in the chair of anatomy at Ferrara. Very soon afterwards (1541 or 1542), he published the first book of his Dissectio (here reproduced in facsimile), containing a very accurate representation of the muscles and bones of the upper arm and forearm. The whole work was planned to include many books, probably five ; the first alone was published and very few copies of it remain. What happened ? Simply that VESALIUS came to Ferrara in 1542, saw CANANO and explained

(1) Sic. The correct date seems to be Jan. 29, 1579 (DUCCESCHI).

his own work to him. Poor CANANO, gentle and timid soul, realized that « he had been hopelessly outdone ; in conception, scope, execution, as in color, pomp, intimacy and power » ; he was not a pushing and fighting man, and without further ado he consigned his own work to destruction.

Judging from the first book and also from the testimony of his contemporaries, CANANO was an extraordinary man, who did not simply anticipate VESALIUS but was in some respects superior to him. The first book contains a faithful representation of the palmaris brevis (short palmar muscle) and of other muscles : the short flexor of the thumb, the interossei, the adductor of the little finger ; in short, it offered the first correct description of the muscles of arm and hand. But there is more ; there is no doubt that CANANO was the real discoverer of the valves in the veins. The date of the discovery is unknown, but VESALIUS referred to it already in 1546 (2). If the value of CANANO's discovery had been more promptly recognized, it is likely that the circulation of the blood would have been understood at an earlier time. « Had VESALIUS verified, and treated in a generous and ampliative manner, the findings of CANANO, and given them due weight in his edition of the Fabrica of 1555, the world would not have waited until 1628 for a HARVEY. » It is interesting to notice that FABRICIUS AB AQUAPENDENTE who rediscovered the valves (after many others) in 1574, and who is generally acknowledged as the discoverer, began (in 1561) by pooh-poohing the idea.

To complete this brief account of CANANO's career, it will suffice to say that he became, in 1552, archiater to the pope JULIUS III, who gave him, in 1555, the bishopric of Ficarolo. Later he was called to superintend public health in the duchy of Este. He died in 1579.

If this beautiful volume serves no other purpose but to attract more attention and sympathy upon CANANO, the authors will already deserve our gratitude. For GIAMBATTISTA CANANO was truly as his faithful young friend GABRIELE FALLOPPIO said (in 1561) « a man who, without the least question, is to be numbered among the very forerunners of anatomy, second to none other, in erudition, integrity and courtesy. »

GEORGE SARTON.

Leon Roth. — *Correspondence of* DESCARTES *and* CONSTANTYN HUYGENS, 1635-1647. Edited from manuscripts now in the Bibliothèque Nationale, formerly in the possession of the late HARRY

(2) STREETER gives a good summary of this question on p. 43-46.

WILMOT BUXTON, F.R.A.S. LXXV + 351 p. Oxford, Clarendon Press, 1926.

As most of our readers know only one HUYGENS, CHRISTIAAN, it is well to state at the beginning that this volume does not deal with him, but with his father CONSTANTYN. The latter and DESCARTES were born in the same year, 1596, in two distant places bearing the same name, La Haye : DESCARTES on March 31 at La Haye in Touraine, and HUYGENS on Sept. 4 in The Hague. However DESCARTES's life was untimely cut short in 1650, while his friend lived to be a nonagenarian, dying only in 1687. CONSTANTYN HUYGENS, diplomat and poet, is one of the most brilliant figures in the history of Dutch literature, yet his fame, great as it was, did not and could not extend much beyond the boundaries of his native country. On the contrary, his second son CHRISTIAAN (1629-1695), though perhaps less popular at home, became one of the greatest scientists of the century ; his fame is of international importance. Whenever an international elite speaks of HUYGENS, they mean CHRISTIAAN (1). DESCARTES had a very high opinion of his friend's son, but did not witness the latter's success, which did not become truly significant before 1655, or even 1660. While DESCARTES is perhaps the most typical representative of natural philosophy in the first half of the seventeenth century, HUYGENS and NEWTON are excellent symbols of the second half of the same century. It would be interesting to enlarge upon this,—the very contrast of these names, DESCARTES and HUYGENS, suggest the enormity of the change which had gradually taken place in the course of two generations,—but I must return to the book under review, and to the elder HUYGENS (2).

To underline the value of the correspondence edited by LEON ROTH, it will suffice to remark that it contains 68 autographs of DESCARTES, while before its discovery only about 95 were known. So far as concerns these autographs alone « Mr. BUXTON's collection is equal in number to two-thirds of the total of those existing elsewhere, and is in itself more than three times as large as any other single assemblage ; and we may add that it is unique not only in size but also in completeness, since in the HUYGENS series we have the other and complementary side of what forms one correspondence. » Or to put it in another way « we

(1) See in the present volume (p. 248) a letter of 1646. See also in the *Œuvres complètes* de CHRISTIAAN HUYGENS (t. 1, 14, 1888; *Isis* V, 154) a letter from DESCARTES to DAVID LE LEU DE WILHELM, of the same year. The *Œuvres* contain only one other letter from DESCARTES (to FR. VAN SCHOOTEN, 1649), and it does not refer to CHRISTIAAN; apparently no letters were exchanged between DESCARTES and CHRISTIAAN.

(2) In the remainder of this article, the word HUYGENS will mean the father, CONSTANTIJN.

have in the collection fifty-two letters of DESCARTES, twenty-nine of HUYGENS, three of VAN SURCK, one of MERSENNE, and six documents, in all ninety-one letters and documents, hitherto unknown and entirely new ». The text of some others of the newly discovered letters was known either from copies or from DESCARTES' own minutes, as published by CLERSELIER. But « it would appear probable, even from the few examples to be found in this one correspondence, that much of the tergiversation and temporizing which characterize the DESCARTES of the biographers is due to CLERSELIER's mistaken conceptions of the functions of an editor. »

Such reproach could not be made to the new editor who has completed his task with the utmost faithfulness and accuracy. Indeed his edition is a true paragon. Moreover he has taken pains (1) to present the DESCARTES-HUYGENS correspondence as one intelligible and self-contained whole (that is, he has republished in small type other letters already known, putting them in their proper sequence in the series and adding all necessary explanations), (2) to co-ordinate it with others carried on by DESCARTES at the same time. Again, this has been done in the very best manner.

I have read the whole correspondence (which is mostly in French) and was a little disappointed because it did not add anything essential to our knowledge of DESCARTES' philosophical and scientific ideas. Yet it helps us better to reconstruct his personality, for it gives us some examples of his generosity and humanity, also of his impatience with critics, of his lack of credulity. As concerns the last mentioned point, see for instance, letter 53, p. 129-131 (with facsimile) wherein he makes fun of a miraculous case reported by MERSENNE, the case of a girl of St. Pol de Léon, in Brittany, who had not taken any food for five years. « Mais le bon père MERSENNE » adds DESCARTES « est si curieux et si ayse d'entendre quelque merueille, qu'il escoutte fauorablement tous ceux qui luy en content ».

I shall mention briefly a few of the letters and topics which have arrested my attention. There are many references to optics and to the making of optical glasses. Many letters and documents deal with a controversy on the extraction of cubic roots which occurred in 1639 between JOHAN IANSZ. STAMPIOEN, DE IONGHE, of Antwerp, and J. A. WAESSENAER, of Utrecht (p. 98-128, 264-289). I found two allusions to PASCAL, the first to his youthful *Essay pour les Coniques*, 1639 (p. 128), the other to the *Expériences nouvelles touchant le Vuide*, 1647 (p. 254); DESCARTES' commentary is not to his credit : « Il me semble que le ieune homme qui a fait ce liuret a le vuide un peu trop en sa teste, et qu'il se haste beaucoup ». PASCAL was not going too fast. It is rather DES-

CARTES, who, like BACON, was always too much in a hurry to pooh-pooh the honest experimental work of his contemporaries. A sin common to all philosophers. DESCARTES does not hesitate to compare his own theological demonstrations with the mathematical proofs of APOLLONIOS ; the former, he believes, are as difficult to follow but as conclusive as the latter ! Two of the longest letters (both of 1643) deal with hydraulics, another with the magnet (p. 199-202), still another (p. 240-242) with his views on chemistry. Considerable space is naturally devoted to DESCARTES' contentions with the city of Utrecht and the University of Groningen and the part he took in various controversies : STAMPIOEN-WAESSENAER, BANNIUS-BOËSSET, SAUMAISE-HUYGENS. It must be admitted that much of that is very tedious.

I have already alluded to DESCARTES's dogmatism and unreceptivity, apropos of PASCAL. This is perhaps my most striking impression of the whole book. It is pathetic to put together his theoretical love of experiment and his failure really to understand the experimental spirit. He would go so far as to say (p. 189) : « Je ne me fie gueres aux experiences que ie n'ay pas faites moy mesme », yet he had very little notion of practical experimenting. This was not so much his fault, as a fault of the time. The experimental method was still too undeveloped, and the danger of dogmatic assertions had not yet been sufficiently exposed. Speaking of THOMAS WHITE's *De mundo dialogi tres* (Paris, 1640), DESCARTES remarks (p. 181) « Ie trouve plusieurs choses fort bonnes en son troisiesme dialogue, mais pour le second, où il a voulu imiter GALILÉE, ie iuge que tout ce qu'il contient est trop subtil pour estre vray, car la nature ne se sert que de moyens qui sont fort simples. » Such complacency reminds one of that exhibited by LUCRETIUS. There was much less excuse for it in the first half of the seventeenth century than in the first half of the first century B.C., yet experimental science was still in its infancy. DESCARTES, so modern in certain respects, was still a schoolman in many others.

Every student of science in the time of DESCARTES will do well to consult this excellent edition, and this consultation will be easy enough because there is a very elaborate index. The author is not a stranger to our readers, for I have already had at least two opportunities of praising his activity, first as secretary of the Societas Spinozana (*Isis*, V, 143), second, apropos of his work on SPINOZA, DESCARTES and MAIMONIDES (1924, *Isis*, VII, 324). The splendid presentation of his latest work is a credit to the Clarendon Press. GEORGE SARTON.

Emil Wohlwill (1835-1912). — GALILEI *und sein Kampf für die Copernikanische Lehre*. I. Band bis zur Verurteilung der copernikanischen

Lehre durch die römischen Kongregationen, Hamburg und Leipzig, 1909. XX + 646 p. (Rm. 16).

II. Band nach der Verurteilung der Copernikanischen Lehre durch das Dekret von 1616. Aus dem Nachlass herausgegeben mit einem Porträt und einer Tafel. Leipzig, 1926. Verlag v. LEOPOLD VOSS. XXII + 435 p. (Rm. 18.50).

Nachdem der I. Band in dieser Zeitschrift auch noch nicht besprochen wurde, sei er sogleich mitbehandelt. E. WOHLWILL hat sich durch eine Reihe tiefgründiger Untersuchungen zur Geschichte der exakten Wissenschaften als ein Mann bewiesen von dem man bestes in seinem Werke über GALILEI erwarten konnte. So fand denn auch der I. Band eine freudige, teilweise begeisterte Aufnahme. Er selbst sagt im Vorwort, wie sehr er durch die Benutzung der inzwischen veroffentlichten Nationalausgabe der Galileischen Werke gefördert wurde. Insbesondere konnte er als erster die Jugendschrift *De motu*, die darin zum erstenmal veröffentlicht wurde ausführlich benutzen. Ebenso brachte ihm der 8. Band mit seinen Fragmenten zur Geschichte der Entdeckung der Fallgesetze wertvollstes Material. Da ihm vom italienischen Unterichtsministerium ein Exemplar der Edizione Nazionale zum Geschenk gemacht worden war und er von dem hochverdiensten Herausgeber derselben, Prof. ANTONIO FAVARO in jeder Weise unterstützt wurde, so waren alle Vorbedingungen erfüllt um ein wirklich ernsthaftes Werk entstehen zu lassen. Mit einem ausserordentlichen Fleiss, der womöglich nichts unaufgeklärt lässt und sich nicht scheut, auch Nebenbeziehungen in den erhaltenen Urkunden und der Literatur nachzugehen, hat WOHLWILL eine wirklich umfassende Darlegung der ganzen Entwicklung GALILEIS soweit sie insbesondere als Vorgeschichte des Konflictes mit der Kurie erscheint, dargestellt.

Vieles was vorher falsch beurteilt worden war wird berichtigt aber es ist wohl kaum nötig darauf einzugehen, da ja diese Dinge inzwischen in die allgemeine Kenntnis aufgenommen worden sind. Etwas eingehender müssen wir uns mit dem neu erschienen 2. Bande befassen.

WOHLWILL war 74 Jahre alt, als im Jahre 1909 der I. Band erschien, zu dem die Vorarbeiten 40 Jahre in Anspruch genommen hatten. Am 2. Nov. 1912 starb er. Seinem Wunsche, dass das vorhandene Material der Oeffentlichkeit zugänglich gemacht werden möge, ist durch seinen Sohn Prof. Dr. med. FRIEDRICH WOHLWILL mit Unterstützung namhaftester Fachgelehrter Rechnung getragen worden. Der 2. Band lag nicht fertig vor, als WOHLWILL starb. Es fanden sich Ausarbeitungen zu den ersten 6 Kapiteln, dann das Schlusskapitel « nach GALILEIS Tod », sowie der schon im I. Bande angekündigte Anhang « Sagenhafte Ergänzungen der Jugendgeschichte », schliesslich aber ausführliche Auf-

zeichnungen zu den Prozessakten nach seinem persönlichen Studium des Vatikan-Manuskriptes 1891 niedergeschrieben und eine Abhandlung über den Betrug des SIMON MARIUS aus Gunzenhausen. Es wird vom Herausgeber eben die Gründlichkeit des Verfassers, als der Grund für die langsame Arbeitsweise angegeben, da war auch bei scheinbar nebensächlichen Dingen sich stets zu weitesten Forschungen veranlassen liess. Trotz der allergrössten durch die Kriegs- und Nachkriegsverhältnisse und das besondere Gebiet bestehenden Schwierigkeiten ist es glücklicherweise gelungen auch diesen 2. Band zu publizieren. Die ersten 6 Kapitel enthalten wiederum eine Fülle wissenschafts-geschichtlicher Details ; die Kapitel über den Prozess (VII, VIII) eine überaus fesselnde Analyse der Vorgänge auf Grund der Akten und das 9. Kapitel nach GALILEIS Tode eine kulturgeschichtliche überaus interessante Abhandlung über das Geschick der Galileischen Lehre und seines Bestattungplatzes in Italien.

Von besonderem Interesse werden für viele die detaillierten Untersuchungen über das Vatikan-Manuskript (im Anhang II) sein, wo Verf. seine These verficht, dass der juristische Grund für die Verurteilung GALILEIS durch eine Fälschung überhaupt erst geliefert wurde. Die beigegebene Tafel mit Schriftproben sucht diese These zu erhärten. Wie dem auch sei so gewinnt man doch den Eindruck, dass manche mehr zufällige und auch persönliche Gründe zusammengewirkt haben, um die Situation derartig auf die Spitze zu treiben, wie es zuletzt gekommen ist. Immerhin dürfte abgesehen von solchen Gründen um diese Zeit eine allgemeine Stimmung in der Umgebung der Kurie geherrscht haben, welche den Versuch nahelegte, sich der Untergrabung der bestehenden Weltbildes mit dem Mitteln der Gewalt noch rechtzeitig entgegenzuwerfen. Dass dieser Versuch auf die Dauer ohne Erfolg blieb, ist ja eine der wesentlichen Fundamente unserer heutigen geistigen Situation, der auch die Kurie selbst sich nicht mehr verschliesst. Wichtig sind schliesslich auch die Bemerkungen des Verf. über die sagenhaften Erzählungen aus der Jugendgeschichte, die sich meist als allzugläubige Erzählungen VIVIANIS entpuppen. Weder die Geschichte vom Pendel noch die Sage von den Fallexperimenten am schiefen Turm zu Pisa lassen sich aufrecht erhalten. Ebensowenig die frühzeitige Stellungnahme des jungen GALILEI gegen ARISTOTELES.

So stellen diese 2 Bände WOHLWILLS eine fundamentale Bereicherung unserer wissenschafts-geschichtlichen und wissenschafts-theoretischen Literatur dar und zugleich eine wichtige und schöne Ergänzung der unsterblichen Wirksamkeit ANTONIO FAVAROS.

(*München.*) HUGO DINGLER.

George Lyman Kittredge. — *Alchemy in Early New England.*

KITTREDGE's article on « Dr. ROBERT CHILD The Remonstrant » in the *Transactions of the Colonial Society of Massachusetts* for 1919, vol. 21, pp. 1-146, Boston, 1920, is a report of the results of literary and historical research, but contains a large amount of material on the alchemical activities of the early New Englanders, perhaps more than has ever been brought together heretofore in one place.

Dr. ROBERT CHILD (1613-1654) was born in England and spent considerable time in America. He was friendly with the scientific men of both places, corresponded with those of other countries, and led a life of varied activity. KITTREDGE says :

« I have passed lightly over CHILD's alchemical pursuits in order not to complicate too much our study of this remarkable man. They did not interfere with his practical, every-day interests—medicine, mining, agriculture, speculation in colonial iron works ; nor were they inconsistent with mundane engrossment, for a time, in English-American politics.—Why somebody has not paid serious attention to the alchemical studies of the early New Englanders—WINTHROP and CHILD and STIRK and BREWSTER and AVERY, not to mention later investigators, like President STILES and Judge DANFORTH and Dr. AENEAS MUNSON—I do not know ; but I suspect it is because alchemy ranges with witchcraft in the thoughts of most of us and we feel that this is a case in which « least said, soonest mended » is a sane maxim. In fact, however, there is no connection between the two subjects. Witchcraft looks backward : it reverts to the abysm of time ; it reminds us (not much to our self-satisfaction) of the pit of primeval savagery out of which we are digged, of the miry clay that still adheres to the hem of our rationalistic garments ; it is our vital link with Ashantee and the juju-men of the West Coast. But alchemy looks forward : it is experimental science in the making—science that does not yet acknowledge its finite bounds, but aspires star-eyed to the illimitable possibilities. CHILD's lifetime coincided with the eager stirrings of the scientific instinct in England. Had he lived a few more years, he might well have been one of the founders of the Royal Society, like his friends BOYLE and the younger WINTHROP. For a physician not to study alchemy in those days was a sign that he was either a reactionary or a fossil. »

In 1657 JONATHAN BREWSTER, the son of ELDER BREWSTER of Plymouth Colony, was engaged in the search for the grand elixir in a cabin on the Connecticut frontier. He wrote in January to JOHN WINTHROP, Jr. from the trading post at Manheken (Monhegen), afterwards a part of Norwich. I modernize the spelling :—

"It is 5. years wanting two months before the red Elixir be perfected,

and 4. years before the white, so that my work will be yet til December next, before the colors be & 5 months after before the white appear, and after the white stands a working til perfected by the hot fiery imbibitions, one whole year after til September. I fear I shall not live to see it finished, in regard partly to the Indians who I fear will raise wars: as also I have a conceit that God sees me not worthy of such a blessing, by reason of my manifold miscarriages. "

WILLIAM AVERY was seeking for the alkahest at Boston in 1684 and had taught his son, JONATHAN, to be « an assiduous laborer at the chemical fire »—as is attested by his letters to ROBERT BOYLE.

ROBERT CHILD's interest in alchemy and in occult science appears in the earliest of his letters in the possession of the Colonial Society of Massachusetts, that addressed to his friend WINTHROP in 1641, and remains unabated in the latest extant letter to the same correspondent, dated August 26, 1650. An important passage occurs in CHILD's letter to WINTHROP, written on May 13, 1648, soon after his return to England. I modernize the spelling :—

" I had letters from a friend in Scotland, who hath perfected HELMONT's menstruum, & made many excellent experiments by it for transmutation. He did send a sheet written to me of all of them & some things else but the ship was cast away & his friend who brought these things, hardly escaped with life. I daily expect to hear from him, or else I resolve to see him if peace continue betwixt the 2 Kingdoms, which is much to be feared: Sir I desire you, if you meet with any sorts of seeds or stones, which are not common, to make me partaker of some of them; & I shall willingly do you service in this or any other way. It is reported by divers, that the Emperor of Germany hath found a secret to turn *luna* into *sol* by the which he pays his Army. The Duke of Holstein is turned a great Chymist. Some say (that have good intelligence) that HELIA ARTISTA is born. I saw letters that came to a learned Dr. from the *Fratres* R C to that purpose but he is not of our nation. "

HELIA ARTISTA is ELIAS, the Artist, a divinely enlightened adept for whose coming the alchemists had been waiting, as for a Messiah, who should show them the solution of their difficult problem. « When ELIAS shall come, he shall make all things plain. » KITTREDGE takes the statement in the above-quoted letter to be proof that CHILD himself was not Elias, the Artist, and hence that he was not « EIRENAEUS PHILALETHES (or PHILALETHA), that mysterious adept who discovered the secret of transmutation in 1645 at the age of twenty-three, wrote several books on the subject, — including the thrice-famous Introitus Apertus ad Occlusum Regis Palatium,—and wandered for years about Europe in disguise, occasionally performing the miracle of transmutation. » EIRENAEUS PHILALETHES was evidently GEORGE STIRK or STARKEY.

JOHN WINTHROP, Jr., the first Governor of Connecticut, began his alchemical studies at an early age, for they loom large in the letters he received from the friend of his youth, EDWARD HOWES, from 1628 to

1644. When he died in 1676, he had long had the reputation of knowing the secret of transmutation. This is plain from the Funeral Tribute published in that year by BENJAMIN TOMPSON, « Learned Schoolmaster & Physician & ye Renowned Poet of N. Engl. »—

> "Projections various by fire he made
> Where Nature had her common Treasure laid.
> Some thought the tincture Philosophick lay
> Hatcht by the Mineral Sun in Winthrops way,
> And clear it shines to me he had a Stone
> Grav'd with his Name which he could read alone,"

The epitaph in Mather's Magnalia also testifies to WINTHROP's reputation as a successful alchemist :—

> " *Non* Periit, *sed ad Coelestem Societatem*
> *Regia Magis Regiam,*
> *Vere Adeptus,*
> *Abiit:*
> WINTHROPUS, *Non minor magnis Majoribus.*"

but signifies that, whether or not WINTHROP was an adept in alchemy, he was an adept in the true sense because he had now learned the secrets of the kingdom of heaven.

The diary of President STILES of Yale under date of June 1, 1787, speaks of « the *Governor's Ring*, as it is called, or a Mountain in the N.W. corner of East Haddam », and says :—

> "Govr TRUMBULL has often told me that this was the Place to which Gov. WINTHROP of N. Lond. used to resort with his Servant; and after spending three Weeks in the Woods of this Mountain in roasting Ores & assaying Metals & casting gold Rings, he used to return home to N. Lond. with plenty of Gold. Hence this is called the Gov. WINTHROP's Ring to this day. Gov. WINTHROP was an Adept, in intimate Correspond. with Sir KENELM DIGBY and first chemical & Philosophical Characters of the last Century."

An alchemist friend of CHILD and of WINTHROP was young GEORGE STIRK or STARKEY of the Harvard class of 1646. A son of the Rev. GEORGE STIRK of Bermuda (who died in 1637), he had been especially recommended to the care of the elder WINTHROP by the Rev. PATRICK COPELAND at whose instance he had come to Harvard for his education instead of going to England. In 1644, while still an undergraduate, he began to study chemistry in his spare hours, and was encouraged by the younger WINTHROP who lent him books from his library. In 1647 he was practising medicine in Cambridge or Boston, and was certainly established in Boston in 1648-1650. In England, probably in 1651, CHILD introduced him to ROBERT BOYLE, and STARKEY dedicated his « Pyrotechny Asserted and Illustrated », London, 1658, « To The Honourable, Virtuous, and most accomplished Gentleman, ROBERT BOYL, Esq.; My very good Friend. »

Soon after his removal to London STARKEY exhibited various alchemical manuscripts in Latin which he said were the work of an adept who called himself EIRENAEUS PHILALETHES and which had been given to him in New England by a friend of his who knew the adept well. This story he printed in 1654 in the preface to Part I of a versified treatise entitled The Marrow of Alchemy, a work which he then pretended was written by the friend in question, but which he afterwards acknowledged as his own composition. Concerning STARKEY's acknowledgement that he was himself EIRENAEUS PHILALETHES—an acknowledgement so important for the history of alchemy—KITTREDGE says, « The complete evidence for this acknowledgement is too long and complicated to be given here. One decisive fact, however, may be cited. STIRK prefixed a Latin poem, with an English translation, to JOHN HEYDON's Idea of the Law, 1660, and another Latin poem (dated May 4, 1663) to the same author's Theomagia, 1664, and on both occasions he added his pseudonym « EIRENAEUS PHILOPONUS PHILALETHES » to his own signature —*George* (in the second case *Georgius*) *Starkey*. »

STARKEY allowed copies of his manuscripts to circulate among students of alchemy in England and in Europe where they excited a lively interest. He died of the plague in 1665, according to one account while in prison for his debts (according to another because he dissected the body of a plague victim—T.L.D.). Two years later JOHANN LANGE published at Amsterdam the most important of the treatises, ascribing it on the title-page to « an anonymous philosopher PHILALETHA ». In this work the unknown author describes himself as a true adept who had discovered the art of gold-making in 1645 at the age of twenty-three. Other editions and other tracts followed, at different places and under various editorship, and conjectures were freely made as to the identity of PHILALETHES, who was generally regarded as an authority of the first rank.

CHILD's name became associated with the writings. In 1677 a Moravian physician, JOHANN FERDINAND HERTODT von Todtenfeld, published in the Breslau Ephemerides a Latin epistle on PHILALETHES, which included part of a letter from an English colleague, as follows :

« PHILALETHA Anonymus was really named GEORGE STARKEY. He was an Englishman by nation. Having made the acquaintance of a certain adept called Dr. CHILDE in America or the West Indies (called New England) he received from him an ounce of the White Elixir, one part of which transmuted a thousand times a thousand parts of lead, tin, or common mercury into the best silver. And without doubt, if GEORGE STARKEY had not so quickly shown his hypocrisy, he would have obtained complete knowledge of the art. Wherefore, he then returned to England with his tincture, and carried with him the names or titles

of twelve small tracts on chemistry composed by the learned CHILDE, the names of which I do not remember well but they will be found in the preface of the Marrow of Alchemy written in English, and I do remember the following, which are *Introitus Apertus ad Occlusum Regis Palatium, Brevis manuductio ad Rubinum coelestem, Fons Chymicae Philosophiae, Brevis via ad vitam longam, Elenchus errorum in arte chymica deviantium, Brevis manuductio ad campum Sophiae.* These six tracts were first written in English. Of all of them I have had a copy in my hands, copied from STARKEY's autograph, before they were published in Latin, and so STARKEY was the real author of these twelve tracts, and he carried with him only those twelve titles which Dr. CHILDE had promised that he would later send to him. But when STARKEY saw that Dr. CHILDE would not write to him further, then he composed twelve tracts under those titles which Dr. CHILDE had given.—At the time when he received the tincture from Dr. CHILDE he was twenty-three years old, and in the following year I made his acquaintance. But I did not come to know him well until he had used up all he had. Then, at my expense and that of certain friends of mine, we discovered the emptiness of his words. Now let it suffice to say concerning him in death, ' May he rest in peace. ' »

This epistle soon brought forth an anonymous reply, also published in the Ephemerides—« I will not quarrel with anybody as to whether STARKEY or CHILDE was the author of the tracts which circulate under the name of PHILALETHA,—but I do maintain that nobody could have written them *qui non habuerit penitissimam Chemicae arcanorum notitiam.* »

In 1698, GEORG WOLFGANG WEDEL, in the preface to his edition of the Introitus Apertus declared that PHILALETHES was commonly thought to have been an Englishman named THOMAS DE VAGAN. THOMAS VAUGHAN (1621-1665) was twin brother of HENRY the poet, and wrote under the name of EUGENIUS (not Eirenaeus) PHILALETHES.

JOHANN CONRAD CREILING in Die Edelgeborne Jungfer Alchymia, 1730, avers that the writings of PHILALETHA have become « as familiar to alchemists as their daily bread, and have met with general applause from the majority. » He discusses the identity of the anonymous writer and introduces into the discussion the name of Dr. ZCHEIL, evidently an attempt to spell CHILD phonetically in German.

SCHMIEDER in his History of Alchemy, 1832, thinks that PHILALETHES passed under five names in his travels— THOMAS DE VAUGHAN, THOMAS VAGAN, CHILDE, Dr. ZHEIL, and CARNOBIE, that when he was in America, where he met STARKEY, he called himself CHILDE.

An unverifiable reference in FERGUSON's Bibliotheca Chemica states

that « BACSTROM says distinctly that his [EIRENAEUS PHILALETHES'] name was WINTHROP and that he was STARKEY's patron. »

The failure to identify EIRENAEUS PHILALETHES with GEORGE STARKEY has produced an interesting comedy of errors. KITTREDGE promises more on the subject.

(*Cambridge, Mass.*) TENNEY L. DAVIS.

René Antoine Ferchault de Réaumur. — The natural history of ants. From an unpublished manuscript in the Archives of the Academy of Sciences of Paris. Translated and annotated by WILLIAM MORTON WHEELER. XVII + 280 p. Portrait. New York, ALFRED A. KNOPF, 1926.

Mr. W. M. WHEELER, professor of entomology in Harvard University and director of the Bussey Institution, has nourished for a long time a deep interest in RÉAUMUR. In 1925, he discovered (or rediscovered) among Réaumur's MSS. in the archives of the French Academy of Sciences, a memoir on ants, of which he soon realized the exceptional value. It was relatively easy for him to appreciate that value, as he is himself one of the most distinguished of living myrmecologists (1). He decided that it was worth while to publish that memoir. The present volume does not contain only the original French text (a diplomatic transcription ! which I can not help thinking is a little extravagant) but also an English translation and abundant annotations. The same numbers in both French and English texts refer to these notes ; thus the reader can follow either text as convenient. The editor's notes (42 p.) cover a very wide field, some are bibliographical or literary ; many, the most valuable, entomological.

This is excellent. The ideal annotator of a special scientific text is not so much the historian as the scientific expert, who alone can estimate the full meaning of every scientific fact involved. Or better still, the perfect annotation requires a combination of historical and scientific qualities which are but rarely united in a single head. The whole History of Science implies, as the name indicates, an intimate collaboration of historians and scientists, the former drawing the frames and placing every event in its proper perspective, the latter analyzing more deeply the technical contents of specific works.

To return to WHEELER's publication, it is hardly necessary to underline its interest. The readers of *Isis* know the significance of RÉAUMUR's personality, the greatest biologist and one of the greatest men of science

(1) See *Isis* VI, 578-580.

of the first half of the eighteenth century. They may remember HUXLEY's often quoted saying : « From the time of ARISTOTLE to the present day I know of but one man who has shown himself Mr DARWIN's equal in one field of research — and that is RÉAUMUR. In the breadth and range of Mr. DARWIN's investigations upon the works of animals and plants, in the minute patient accuracy of his observations and in the philosophical ideas which have guided them, I know of no one who is to be placed in the same rank with him except RÉAUMUR. » On the other hand, if WHEELER concludes that a special memoir on ants is truly important, we may well take his word for it. Says he « Even in its unfinished form the work must be regarded as the most important myrmecological document of the eighteenth century. This is obvious when we compare it with the only other serious contributions of the time on the same subject, namely those of SWAMMERDAM (1737-1738), LINNAEUS (1741), WILLIAM GOULD (1747) and DE GEER (1777). » They will find abundant proof of this in the annotations.

The memoir itself is preceded by a biographical sketch largely derived from GRANDJEAN DE FOUCHY, CUVIER and MIALL. The many references to RÉAUMUR's predecessors and successors increase the interest of this sketch ; it gives us a sort of cross section of the development of myrmecology, and even of entomology. We can reconstruct the apostolic succession which led from the early naturalists, through RÉAUMUR, to LATREILLE, AUDOUIN, LEPELETIER DE SAINT-FARGEAU, LÉON DUFOUR, FABRE, PAUL MARCHAL, FERTON, and many others in France ; to WILLIAM GOULD in England ; to CARL DE GEER and GOTTFRIED ADLERZ in Sweden ; to CHARLES BONNET, the blind FRANÇOIS HUBER and his son PIERRE (1810), and AUGUSTE FOREL in Switzerland ; — to WHEELER himself in America. And this suggests the query : when shall we be given a good history of entomology ? (2)

I forgot to say that the memoir here published was written sometime between the end of October 1742 and January 1743. It was probably meant to be a part of RÉAUMUR's greatest work, his famous « Mémoires pour servir à l'Histoire des Insectes », of which six quarto volumes were issued between 1734 and 1742. The seventh volume was never completed, though RÉAUMUR lived until 1757. It may be that he was discouraged by the immense success of BUFFON's work ; it may be also that he became more deeply engrossed in the many other subjects which always divided his attention. The rivalry between RÉAUMUR and BUFFON is very well explained by the editor ; it is possible however that his in-

(2) MAURICE BOUBIER gave us recently a very readable and well informed history of ornithology. Paris 1925. (See *Isis* VIII, 515-17)

tense sympathy for the former has caused him to judge the latter with undue severity. BUFFON was excessively adulated, then neglected and almost despised ; the pendulum seems to be swinging again the other way (*Isis*, IV, 327; VII, 226; IX, 487). Leaving BUFFON alone, it is probably right to say that RÉAUMUR was the creator of economic entomology, and also of ethology ; he was also the first critical student of instinct (before REIMARUS, 1762). His weakest point was classification, but we must not forget that his work was pre-Linnaean and that the arrangement of animals (and especially of the lower classes) was then exceedingly chaotic. For RÉAUMUR, as for the other naturalists of his day, the « insects » included not only worms, polyps, mollusks, arachnids, myriapods and crustaceans, but even reptiles. Thus he called the crocodile an insect ; he admitted that it was a fierce one ! RÉAUMUR classified the insects primarily according to their « industries », that is, his classification was ethological. As WHEELER remarks such classification must not be too lightly dismissed, it may be prophetic of future developments.

« The taxonomy of the future may be expected to place increasing stress on physiological and ethological characters. We may say that our present systems provide only for a completed evolution, not for one that is actually taking place, that is, for one in which the functional has not yet had sufficient time to acquire macroscopically or even microscopically detectable, though it very probably has chemically detectable, structure. The future task of taxonomy it will be admitted, is a formidable one, but must be undertaken if classification is to be a system embodying in condensed form all the ascertainable data, functional as well as structural, relating to the genetic affinities of organisms, past and present. The exclusion of physiological and ethological characters from our existing systems is due partly to the great difficulties of including them without introducing confusion, and partly to our ignorance of the behaviour of the great majority of animal species. »

This valuable addition to the historical literature of entomology is completed by a list of RÉAUMUR's works, 104 items dating from 1708 (Aet. 25) to 1763.

GEORGE SARTON.

Felix Klein. — *Vorlesungen über die Entwicklung der Mathematik im 19. Jahrhundert*. Teil I. Fur den Druck bearbeitet von R. COURANT und O. NEUGEBAUER. 385 S. gr. 8°m. 48 Figuren. Berlin, JULIUS SPRINGER, 1926 (Preis geb. 22,50 RM.)

Die Vorlesungen die hier zur Veröffentlichung kommen, hat KLEIN während der ersten Kriegsjahre vor einem kleinen Zuhörerkreis in seiner Wohnung gehalten und sie mit Unterbrechungen bis zum Jahre 1919 fortgesetzt. Sie sollten überarbeitet werden und als selbständiges Werk erscheinen. Aber der Tod trat dazwischen. So hat sich jetzt KLEINS

Schüler COURANT entschlossen, sie trotz aller anhaftenden Unvollkommenheiten so herauszugeben, wie sie bereits autographiert vorlagen, und nur das Notwendigste zu ergänzen. Die Herausgeber heben die Mängel, die infolgedessen dem Buche anhaften, im Vorwort selbst ausführlich hervor. Das ist vor allem die Lückenhaftigkeit und Unausgeglichenheit der Darstellung, wie sie einem mündlichen Vortrag eignet, bei dem noch dazu die Themen ganz nach Gelegenheit ausgewählt wurden. KLEIN hat natürlich hauptsächlich über die Gegenstände gesprochen, denen er selbst am nächsten stand. Aber auch ursprünglich beabsichtigste Kapitel, wie über POINCARÉ (der nur ganz kurz erwähnt ist) und SOPHUS LIE fehlen.

Wenn man das Buch als Historiker liest, wird man noch mehr vermissen. Es ist vor allem die Ungenauigkeit aller historischen Angaben und Zitate, die dem Historiker unangenehm auffallen wird. KLEIN hatte wohl historisches Interesse; aber er kannte nicht die Bedürfnisse der wissenschaftlichen Geschichtschreibung. So sind z. B. die meisten Arbeiten der grossen Mathematiker nach den « Werken » zitiert, nicht nach den Originalabhandlungen. Man kann also aus dem Buche oft kaum das Jahrzehnt entnehmen, wann eine Arbeit entstanden ist.

Trotzdem begrüsse ich diese Vorlesungen, da sie nun anders nicht zu haben sind, auch als Historiker aufs wärmste. Denn die « Geschichte » besteht schlieszlich nicht aus Daten. Leider wissen wir aus früheren Zeiten oft nicht mehr als diese. Hier wird uns aber mehr geboten. Die grosze Entwicklungslinie ist ja überall da; was aber dazu kommt, das ist das Persönliche. All diese Männer, die hier auftreten, hat KLEIN — wenn man von den ältesten absieht — persönlich gekannt, oder wenigstens mit ihnen schriftlich verkehrt. Auch über solche, die er nicht mehr kennen konnte, wie JAKOB STEINER, erfährt man manches Neue. Was noch dazu kommt, diese Vorlesungen zu einer fesselnden Lektüre zu machen, das sind die allgemeinen Urteile über wissenschaftliche Strömungen und Zeitverhältnisse. Ich kann also auch als Historiker sagen, dass ich diese Vorlesungen für eine sehr wertvolle Vorarbeit zu einer wirklichen Geschichte der Mathematik des 19. Jahrh. halte.

Nur kurz will ich zum Schluss noch angeben, was das Buch denn enthält. Dazu führe ich am besten die Kapitelüberschriften auf. I. GAUSZ. II. Frankreich und die Ecole Polytechnique in den ersten Jahrzehnten des 19. Jahrhunderts. III. Die Gründung des Crelleschen Journals und das Aufblühen der reinen Mathematik in Deutschland. IV. Die Entwicklung der algebraischen Geometrie über MÖBIUS, PLÜCKER und STEINER hinaus. V. Mechanik und mathematische Physik in Deutschland und England bis etwa 1880. VI. Die allgemeine Funktionentheorie komplexer Veränderlicher bei RIEMANN und WEIERSTRASZ. VII. Vertiefte

Einsicht in das Wesen der algebraischen Gebilde. VIII. Gruppentheorie und Funktionentheorie, insbesondere automorphe Funktionen.

Ein alphabetisches Namenverzeichnis beschliest den Band. Ein zweiter Band soll folgen, der der Entwicklung der allgemeinen Invariantentheorie und Relativitätstheorie gewidmet sein wird.

(*München.*) H. WIELEITNER.

A. Kammerer (Ministre plénipotentiaire). — *Essai sur l'histoire antique d'Abyssinie*. Le royaume d'Aksum et ses voisins d'Arabie et de Meroe. 198 p., avec 45 planches hors texte et 4 cartes. Paris, GEUTHNER, 1926 (60 frs.)

Le titre de ce bel ouvrage n'en indique pas toute la richesse. Sans doute il contient une mise au point fort bien faite de nos connaissances sur l'ancienne Abyssinie, c'est-à-dire une période de huit siècles (du I^er^ siècle av. J.C. jusqu'au VII^e^ après). Ce résumé est fort utile, mais ne nous apprend rien qui soit essentiellement neuf, car nos connaissances sur cette période antique n'ont guère progressé depuis la publication de l'histoire d'ENO LITTMANN (*Deutsche Aksum Expedition*, vol. I, Berlin, 1913). Les parties les plus importantes de l'ouvrage sont les annexes IV et V, dont la première (p. 154-170) contient une description des monnaies d'Aksum du Cabinet des Médailles de Paris, et l'autre (171-180) un compte-rendu succinct des découvertes toutes récentes (1922-1925) du R.P. AZAÏS, un capucin français. Ceci est une vraie et grande surprise.

« Ce missionnaire, au cours de ses voyages des deux dernières années, a retrouvé dans le Harrar, c'est-à-dire à plusieurs centaines de kilomètres au sud d'Aksum et beaucoup plus loin encore jusque dans la région des lacs Zouaï et Margherita, c'est-à-dire au pays Sidamo, des monuments qui témoignent que le centre de gravité de l'Abyssinie n'a pas toujours été l'Empire aksumite et a pu se trouver, soit avant, soit après la période glorieuse de ce dernier, bien plus au sud dans des pays non effleurés par les races sémitiques venues de l'Arabie. Ces monuments se rattachent à divers ordres. Les plus anciens dolmens et menhirs sont mégalithiques. En tous points pareils à ceux de la France, ils démontrent la communauté évidente des tendances des civilisations primitives de l'Europe et de l'Afrique du Nord. D'autres monuments pourraient se rattacher à l'âge du bronze, telles ces pierres sculptées et gravées, grossièrement taillées en forme humaine, avec la représentation de glaive ou d'épée, comme on en trouve, paraît-il, d'analogues en Europe ; d'autres, enfin, sont des monolithes phalliques d'une catégorie inconnue jusqu'ici et sur l'antiquité desquels les conjonctures les plus larges sont possibles. »

Ces menhirs phalliques sont particulièrement intéressants, à cause de leur nombre, de leur grandeur, et de leur réalisme. Le P. AZAÏS en a recensé plus de 1200 rien qu'au pays Sidamo ; leur nombre total doit être considérable ; certains atteignent 6 m. de haut ! Enfin beaucoup sont en basalte dans des pays où le basalte manque. On conçoit aisément l'immensité de l'effort accompli. Malheureusement ces monuments sont tout à fait dépourvus d'inscriptions.

Je n'ai pas le temps d'étudier les problèmes que soulèvent ces menhirs, et je me bornerai à indiquer ici que quelques points de comparaison pourraient peut-être être trouvés dans le mémoire de feu HENRY PARKER. Stone circles in Gambia (*J.R. Anthrop. Inst.*, vol. 53, 173-228, 1923). PARKER décrit les très nombreux cercles de menhirs découverts par lui dans la Gambie anglaise (pays Mandingo) ; leur nature phallique est bien moins claire que celle des menhirs de Sidamo.

L'ouvrage est admirablement illustré. Il contribuera sans doute à stimuler la renaissance d'études abyssines qui a commencé il y a une quinzaine d'années, grâce surtout au Musée de Berlin, aux efforts du savant italien CARLO CONTI-ROSSINI (voir bibliographie à la p. 14), et à la publication de la revue *Aethiops* (1922, etc.) chez GEUTHNER à Paris. En particulier le public savant attendra avec impatience les résultats des nouvelles expéditions du R.P. AZAÏS dans le pays Sidamo.

GEORGE SARTON.

Francois Lexa. — *La Magie dans l'Egypte Antique de l'Ancien Empire jusqu'à l'Epoque Copte*. 3 vols. PAUL GEUTHNER, Paris, 1925.

The work before us for review upon magic in ancient Egypt is written by a professor at the University Charles in Prague and attractively printed at Alençon. We like this geographical combination, with its blending of remote antiquity, the *ancien régime*, and the oldest university in Germany and central Europe, its recourse of a modern metropolitan publisher to an outworn medieval provincial center of civilization. But to our magic. Tome I, *Exposé*, after grappling with the problem of the definition and aim of magic, deals successively with magic formulae, remedies, images and statues, amulets, and rites. A supplementary section on magic names is then added. Next we proceed to the relations between magic and religion and between magic and science, to the magic related in ancient Egyptian belles-lettres, to Coptic magic and the accounts of magic in Coptic belles-lettres, and to the relations between Egyptian and Greek magic in the Greco-Roman period. Tome II, *Les Textes Magiques*, of about the same number of pages as the preceding—220 and 230 respectively, gives French translations of magical passages from the Pyramid Texts, tomb and coffin inscriptions, the Book of the

Dead, the Book of Magical Formulae for Mother and Child, the Strasburg ostracon, the Harris papyrus, the Turin papyri, the Leyden papyri, the Salt papyrus, the Table of Metternich, the Book of the Dragon Apop, the medical papyri (Ebers, Hearst, London, and Berlin), the Letter of a widow to her husband's spirit, procès-verbaux on the palace revolt against RAMESES III, the demotic magical papyri of London, Leyden, and the Louvre, the Westcar papyrus, Coptic papyri, and a few other sources. The author explains that only a portion of the texts which have been preserved have as yet been studied, and estimates that he publishes in the present volume only a third of those which he has studied and translated. But he assures us that the other two-thirds contain nothing new, and that texts as yet unstudied would be unlikely to affect his conclusions. At the head of each translation he gives a useful bibliographical note anent the papyrus or other text from which it is drawn. Tome III, *Atlas*, is a collection of seventy-one plates showing various Egyptian amulets, sculptures, mannikins, and tables of hieroglyphs which seem to be connected with the practice of magic. The work is well written and documented, and the material clearly presented and well arranged for the convenience of the reader. There is a good index.

After examining a number of definitions of magic by previous writers on the subject, most of which he finds in one way or another unsatisfactory, Professor LEXA briefly defines it as « activity tending to produce an effect of which the connection with that action is not subjectively explicable by the law of causality » (« c'est l'activité tendant à produire l'effet dont la connexion avec cette action n'est pas subjectivement explicable par la loi de causalité ». This definition will perhaps do as well as any other, but I must object to the author's application of it. Instead of identifying superstition in general with magic, as this definition would seem to warrant, LEXA regards many superstitions as not magic, for instance, divination and astrology. But if a diviner kills a sheep to read the future in its entrails, is not that activity tending to produce an effect (namely, knowledge of the future) which has no causal connection with examination of the entrails and in most cases is not even subjectively explicable by the law of causality? What essential difference is there between shaking dice or star-gazing in order to determine the future, and making a wax image of a crocodile in order to kill an enemy? If one shook dice or scrutinized the stars in order to kill an enemy, LEXA would call it magic, and if one made a wax image of a crocodile in order to predict the future, he would have to call that magic too. As a matter of fact, he himself later more than once confuses astrology or divination and magic. Thus in vol. I, pp. 100-101, we read that the sorcerer who wishes to question the sun ought to stand erect in an open space to be

able to see the sun when it rises; if he wants to question the moon, he ought to remain under a house roof. Sorcerers should leave to astrologers such questioning of the planets. In vol. II, p. 150, we find a recipe, « How to tell if a woman is pregnant. You bid the woman urinate in the evening on the plant mentioned above. If at daybreak you find the plant withered, the woman is not pregnant ; if you find it fresh, she is. » Surely this is a form of divination. Whether we wish to call such other forms of superstition magic or not, it seems to me that it would be better to treat them together with it. Their various relationships and intertwinings would then be seen more clearly than when they are treated separately, and there would be a gain in unity and comprehensiveness.

As it is, LEXA's restricted interpretation of magic limits considerably the scope of his book, excluding many forms of superstition and most occult sciences. Thus his content is limited chiefly to incantations and amulets and magic images, although drugs, poisons, and magic remedies receive some attention. In short, he deals simply with sorcery. And in Egypt he finds that magic rites play a small part in the records compared to the formula of words or gibberish. This sort of magic, despite its relation to medicine and religion, and despite our author's insistence that it has always been an important element in every stage of culture, does not have as close a relation to the history of science as do some other forms of superstition. Thus to the natural substances of which amulets should be made our author devotes only seven lines of his *Exposé* (I, 93). They might be made of anything whatever, but if their efficacy was to be guaranteed, each one must be made of a substance very precisely defined, as he illustrates by passages from the Books of the Dead. If more such material were offered, the work would be of more interest to readers of *Isis*. But perhaps there is not much material of that sort available, and certainly within the limits that he has laid down, the author seems to have given a faithful and complete picture of the extant literature and the ancient Egyptian mind as revealed through it.

From his bibliography I have gleaned some useful references, and have but one suggestion to make. In vol. II at page 99 it would seem that the Edwin Smith Papyrus and Professor BREASTED's paper should be listed with the other « Livres de médecine, » though of course less magical than they. LEXA does refer to it at page 30 of the first volume, but this passage has been overlooked in making the index.

(*Columbia University, New York.*) LYNN THORNDIKE.

George W. Corner. — *Anatomical texts of the earlier Middle Ages.* A study in the transmission of culture with a revised Latin text of

Anatomia Cophonis and translations of four texts. 112 p., 3 pl. Published by the Carnegie Institution of Washington, Washington, 1927.

Of the many publications of the Carnegie Institution of Washington relatively few have been thus far devoted to the History of Science, but these few reveal very high standards and are contributions of permanent value. If quality and not quantity is the aim, then the Carnegie Institution has done remarkably well for our studies within the last twelve years. It will suffice to recall the edition of PTOLEMY's Catalogue of Stars by CH. H. F. PETERS and E. B. KNOBEL (1915; *Isis*, II, 401), the edition of ULUGH BEG's Catalogue by E. B. KNOBEL (1917; *Isis*, II, 413-415) and more recently the History of Agriculture in the Northern United States, 1620-1860 by P. W. BIDWELL and JOHN I. FALCONER (1925; *Isis*, VIII, 621; *Nature*, 117, 506-508, 1926). This encourages us to consider any new publication bearing the same imprint with due respect and keen anticipation. I am sure that the present volume will not disappoint its readers and that on the contrary it will reënforce their habit of expecting much from any publication issued by the Carnegie Institution of Washington.

The author, a graduate and M. D. of Johns Hopkins, Baltimore, is now professor of anatomy in the University of Rochester, New York. His book is a capital contribution to the study of mediæval anatomy, or more specifically to the study of anatomy during the period which elapsed between the middle of the XIth and the middle of the XIIIth century. A critical period indeed, for it witnessed the birth and infancy of European (Latin) anatomy.

Much has been written on the subject, but a first hand investigation of the earliest anatomical texts was the more needed, in that our medico-historical books contain many unclear and contradictory statements, which have not been improved by being carelessly copied from one book into another. In his introduction, CORNER gives us a good summary of the beginnings of Salernitan medicine pointing out the smallness of our positive knowledge. A new age may be said to begin in the second half of the XIth century with CONSTANTINE THE AFRICAN who was the first to translate a number of Arabic medical works into Latin, chiefly the Kitâb al-malikî (Pantegni) of 'ALÎ IBN 'ABBÂS. The anatomical books of the Pantegni continued the Galenic tradition, but without any evidence of actual observation of the animal body or of experiment. The publication of the Latin translations of al-Malikî, and of Hippocratic Aphorisms was apparently the spark which revived medical and anatomical interest first in Salerno and the Norman possessions of South Italy and later gradually in the whole of Latin Christendom. CORNER's purpose was to investigate as thoroughly as possible the first fruits of that revival. He made a careful

study based upon the MSS. (of which he found some better ones) of the five earliest anatomical texts, as follows :

1. *Anatomia Cophonis* (*First Salernitan Demonstration*), dating from the beginning of the XIIth century (or the end of the XIth ?) and based upon CONSTANTINE'S translations. CORNER gives us a new critical edition of that text (3 p.). He shows that the ascription to COPHO is entirely unwarranted. SUDHOFF and others have claimed that this text was pre-Constantinian; if so its present form is the result of a later revision. « It is either a pre-Constantinian work revised under the new influence, or else it is post-Constantinian, but prepared by a writer who was not fully a master of the new vocabulary. »

2. *Second Salernitan Demonstration*. Probably contemporaneous with the first, but a little youger, for it may be considered a criticism and extension of it. (It is more than four times longer.) CORNER proves by actual confrontation that the author of the Second Demonstration took some of his paragraphs almost bodily from the Pantegni, while others based upon the same source were more or less modified. We know nothing about the author except that he wrote at least three other books, namely, commentaries on the Hippocratic Aphorisms, and on the works of THEOPHILOS PROTOSPATHARIOS and ḤUNAIN IBN ISḤÂQ.

In spite of their dissimilarities in size and other respects these two earliest texts are clearly related, the second being probably as aforesaid an improved edition of the first. « The two works not only approach their common task, that of conducting a public dissection of the pig, in a generally similar way, but they are arranged in the same order, dealing first with the neck, then with chest and abdomen, then with uterus and brain. They become vague and sketchy on similar subjects, as, for instance, the blood-vessels and the abdominal membranes. They agree in totally omitting the skeleton, except the cranium. They intermingle in the same way anatomical, physiological, and pathological discussion. They mention in general the same lesions and symptoms. »

3. *Anatomia Mauri*. If the Maurus who wrote this anatomy is the Salernitan physician who died in 1214 (and this is very probable); this text can hardly be earlier than the second half of the XIIth century. At any rate it is probably somewhat younger than the two previous texts, though based upon the same sources. « Like these texts, it begins with a definition of anatomy, with reasons for choosing the pig as object of study and with directions for killing and bleeding the beast. The description of the organs is given in the same order; a few pathological notes are included, very similar to those of the other two Demonstrations; and finally the text concludes with a description of the brain, cerebral membranes, and eyes. »

Whatever their respective ages, the three texts thus far considered were derived from the same source, CONSTANTINE's translations. « In one repect, however, they were not dependent upon their source; that is to say, in practical sense, in polemic vigor, and ardor for truth. If we do not find the Salernitan anatomists improving upon the science of their predecessors, we may at least respect them as careful and exacting schoolmasters. The three little books taken together give us a lively picture indeed of these men engaged in actual dissection of the animal body, surrounded by questioning pupils for whose benefit they try to fit their newly recovered relics of Galenic description to the pig's organs before them; now dogmatic, now puzzled; careful in demonstration, resentful of criticism; in short, living men, teaching from the specimen and not from books alone — an unexpected thing in mediæval anatomy, not to be seen again until the days of MUNDINUS. »

The two following texts introduced a new preoccupation, the wish to systematize; they betray scholastic influences.

4. *Anatomia Ricardi* (*Salernitani*) also called in a somewhat longer edition *Anatomia Magistri Nicolai* (NICOLAI may possibly be a misreading of RICARDI in the Beneventan script). Though still based upon the same source this work « differs widely from those previously discussed. It is in the first place a systematic descriptive anatomy, dealing with all parts of the body in logical sequence, rather than in an order dictated by convenience of dissection. It purports to describe the human body, rather than the pig. Moreover, the subject-matter is handled in a highly organized style, much space being devoted to definition, classification, and arrangement of the material. »

These treatises date probably from the second half of the XIIth century; if we place the *Anatomia Mauri* soon after the middle of the century, we should place the *Anatomia Ricardi* towards the end of it.

5. *Anatomia vivorum* (*Anatomia Ricardi Anglici*). The author found a new manuscript of it in the Public Library of Chartres, dating from the middle of the XIIIth century. The treatise itself was not written much earlier : it certainly dates from the first half of that century, probably from c. 1225. It is essentially different from all previous ones in that it is based upon new sources : GERARD OF CREMONA's translations of the Kitâb al-Manṣûrî of AL-RÂZÎ and of the Qânûn of IBN SÎNÂ, and a translation of ARISTOTLE's Natural History. The translations of GERARD OF CREMONA marked a new step in the assimilation of Arabic and ancient knowledge, even more pregnant than that made by CONSTANTINE THE AFRICAN just a century before. It is possible that the *Anatomia vivorum* influenced the contemporary Dominican school which was then nursing the genius of ALBERT THE GREAT. CORNER shows that the naming of

two last texts after RICARDUS SALERNITANUS and RICARDUS ANGLICUS, respectively, is accidental and somewhat misleading; we know nothing certain about these ascriptions.

Outside of the new text of the *Anatomia Cophonis*, this excellent volume contains integral English translations of four of these early anatomical treatises. The main documents of the case are thus disclosed for the first time to the English reader. There is also a well selected bibliography. I find much to praise in this book, and nothing to blame, except a fantastic transcription of Arabic words (e. g. Khitaab for Kitâb) — this can easily be corrected and forgiven — and the failure to provide a translation of the *Anatomia Mauri*. This is the more surprizing in that this text is relatively short (1) (hardly longer than the *Anatomia Cophonis*) and that this corpus of early occidental anatomy remains somewhat incomplete without it. GEORGE SARTON.

Cheikh Mohammed Abdou. — *Rissalat al Tawhid*. Exposé de la religion musulmane, traduit de l'Arabe avec introduction sur la vie et les idées du Cheikh MOHAMMED ABDOU. Par B. MICHEL et le Cheikh MOUSTAPHA ABDEL RAZIK, XC + 150 p., PAUL GEUTHNER Paris, 1925.

This is an attempt to put before us the life, personality and ideas of MUHAMMED 'ABDÛ (A. D. 1849-1905), who was the most prominent, sane and influential of the reformers and renewers of Islam in the Egypt of the latter half of last century. It contains inthe introduction a good and full biography, well documented; a study of his essential religious ideas; an outline of Islam as he understood it; and a bibliography of his life and works, not quite complete. There follows a translation of a course of theological lectures delivered by him at Beirout, in 1885, during an enforced exile from Egypt because of his part in the insurrection of Arabi Pasha. In these he begins with a sketch of the historical development of theology as a science in Islam and follows that with an outline of the resultant theology, arranged much according to the normal Muslim scheme. It is, therefore, a carefully built-up structure of reasoned proofs, starting with a philosophical bottoming on the categories of knowledge — the impossible, the contingent and the necessary. But while it is thus apologetic, systematic and dogmatic, the spirit is very different from that of almost all other such compends in Islam. Religion is shown as an essentially simple and rational thing; it may lead to subtle details, but we should not confuse our minds with these; human nature, socially and individually, calls for religion, needs it and can grasp it.

(1) It was edited by W. L. H. PLOSS (Leipzig 1921), see *Isis*, IV, 584.

God has, therefore, revealed himself to us by the prophets, so far as his absolute being can be revealed, and we must accept their statements, which we will find verified on and by comparison with the facts of our own natures and of life. This holds in a supreme sense of the final revelation through MUHAMMAD in the Koran and in these few traditions from him which are absolutely certain. The Koran itself urges us to apply our reason to its own utterances and to the facts of life. But we should not involve ourselves either in dogmatic literalism or in dialectic subtleties; take the texts reasonably, and remember that God is different from us and is ungraspable by us.

These lectures were evidently meant for a Muslim audience which was in trouble between modern science and its traditional faith. That faith had crystallized — or, rather, ossified — and they must break loose and begin again from the Koran and the figure of MUHAMMAD. To those so doing, the lecturer evidently believed, there need be no conflict between religion and science, and Islam could face the modern world. In this he was probably much more sincere than AVERROES who used a similar defence in the group of tractates which he intended for the general public. The decadence of the Muslim world during the last few centuries is freely admitted, in fact stated in lurid colours. But the early spread and the early intellectual life of Islam show its divine origin, and Muslims have failed because they did take not the medicine — that is his metaphor — which their own faith furnished. Islam is a more rational faith than Christianity and better adapted to the world; yet the Reformation brought Christianity closer to Islam, and the Unitarian wing of Christianity is separated from Islam only by its rejection of MUHAMMAD as the supreme religious guide. MUHAMMAD 'ABDÛ's position was thus closely akin to the liberal Christianity of last century, both as to explaining away the difficulties of the Bible and attempting to rationalize theological positions. It had also kinship with the « back to the Bible » and « back to CHRIST » cries of our own time. This book, therefore, has a right to notice in *Isis* as a significant contribution to the so-called conflict of religion and science. It may be commended, also, to the student of Muslim theology; he will find much in it which to him will be highly suggestive, e. g. the effect of mysticism upon MUHAMMAD 'ABDÛ in awakening him to the realities of life, and other parallels in his development to that of AL-GHAZZÂLÎ. And also, to the student of social influences; MUHAMMAD 'ABDÛ was a *fellah*, a product of the age-long soil of Egypt, before he came to be Chief Mufti there, and in his devotion to that soil and in his preaching of the patriotism of the soil we can see the origin of the present Egyptian nationalist party — a strange blend of loyalty to a great past, theological certainty and peasant patriotism.

D. B. MACDONALD.

Konrad Miller, — *Mappae arabicae*. Arabische Welt-und Länderkarten des 9. - 13. Jahrhunderts in arabischer Urschrift, lateinischer Transkription und Übertragung, in neuzeitliche Kartenskizzen, mit einleitenden Texten herausgegeben. Selbstverlag des Herausgebers. Stafflenbergstrasse 54, Stuttgart, 1926 (et sqq.)

The author of this work might be compared to the phœnix. His activity began at a time when most of us were still unborn, and though it does not seem to have ever been interrupted, the fruits of it have appeared only intermittently after long intervals. Thus, to quote only his main publications, the « *Weltkarte des* CASTORIUS » appeared in 1888, the « *Mappæ mundi* » were completed ten years later (6 vol., 1895-1898), the *Ebstorf map* followed more quickly (1900), but then sixteen years elapsed before the appearance of the *Itineraria romana* (1916). Ten more years pass (1) and the phœnix reappears once more, apparently his former self again, and this time he offers us a most welcome gift, a very extensive collection of Muslim maps together with introductory remarks and the first attempt at a critical study. This rhythm is admirable and we only wish that it were more common. Most scholars want to be in the limelight all the time, they can not feel happy unless they publish books or papers with about as much regularity as a hen lays eggs, and not only that but they publish the same views or discoveries over and over again in different forms, each time with sufficient real or faked novelty to catch the reader's attention, yet without sufficient ground to retain it. Thus is the bibliographer's task considerably increased without reason. Oh ! how happy the critic would be if all scholars were like KONRAD MILLER, of the phœnix type, content to disappear from the public view for many years at a time, to continue their work silently, slowly, austerely, to reappear only when they had gathered abundant fruit and had something really worth while to offer.

The present work, which completes fitly his previous publications devoted to Western cartography, aims to be a sort of corpus of Muslim maps. « Wir geben die alten Originale alle möglichst vollständig wieder, auch wenn die Cdd. nahe verwandt oder ähnlich sind, weil wir sie als Denkmäler betrachten, welche auf Veröffentlichung ein Recht haben. Nur die Cdd. des AL VARDI und KAZWINI sind zu zahlreich und zerstreut, und teilweise zu oberflächlich gezeichnet, als dass wir bei ihnen hätten Vollständigkeit anstreben können. Wir geben nur die wirklichen, in natura aus alter Zeit überlieferten Karten, nicht aber aus dem Text

(1) In 1919, MILLER published a smaller work : Die Erdmessung im Altertum und ihr Schicksal (64 p.) Stuttgart, STRECKER und SCHRÖDER (all of his works were published in Stuttgart), which I only know through CHR. MEHLIS's brief review of it in *Petermanns Mitteilungen*, vol. 68, 27, 1922.

konstruierte, obwohl letztere oft wissenschaftlich höher zu stehen scheinen (wie es aus den PTOLEMÄUS-Karten bekannt ist), während ihnen tatsächlich moderne, den Alten fremde Gedanken unterschoben sind. » To these facsimiles, which are to be the sources of any further study, are added transcribed maps, wherein the same original outlines are reproduced but all names transliterated as well as possible. It is hardly necessary to insist upon this restriction : as well as possible. The task is always difficult, and the result remains very often doubtful. It will suffice to remind the reader non conversant with Arabic, that many different consonants are distinguished only by means of dots, which are often lacking, in which case the reading of a proper name becomes very ambiguous. Furthermore the edition and translation of Arabic geographical texts are still very far from completion or perfection. The editor first thought of publishing his maps in chronological order, but this proved to be unpractical. It was undoubtedly better to classify the maps by geographical topics, for example to consider together all the maps relative to the Maghrib, inasmuch as each map may thus help to elucidate the others. This is the order actually followed by the editor. The wisdom of such a course appears more clearly when one considers the peculiarities of Muslim maps, as I shall show presently.

Muslim maps are in some ways essentially different from the occidental maps. The latter represent an almost unbroken tradition which can be traced back to the time of ANAXIMANDER. The earliest Greek maps are centered upon the Aegæan sea, and they already exhibit the division of the world into three fundamental parts : Europe, Asia, Africa. That is, we detect almost from the beginning a unitary, synthetic view.

Oriental maps were different from the very outset. To be sure the early Sumerian maps were also synthetic, but in this case the synthesis was arbitrary; to conceive the earth as entirely surrounded by the Ocean or as having four corners (kanephot) was an unwarranted extrapolation of their knowledge. The biblical description of Eden is subject to the same criticism, though it was based to some extent upon real facts. For example the four rivers of Paradise were probably the Euphrates, the Tigris, the Nile and some Arabian wâdy (the Wâdy Hamd ?). The oldest true map that has come down to us is a papyrus fragment (Turin Museum) representing part of the country between the Nile valley, near Edfu, and the Red Sea; it dates from the time of RAMSES II (XIIIth century B. C.). The earliest world map extant, a Babylonian tablet of the VIIIth century B. C. is almost as schematic as the description of Eden above mentioned; it hardly deserves to be taken into account. As far as true maps are concerned — and the Egyptian map of Turin is a true map — Oriental maps were at first restricted to special countries; their gene-

ral maps were constructed later by the combination of particular maps. The Greek method was opposite : it would seem that world maps were designed first, and special maps, later.

To return to the Muslim maps, we would expect to find some prototypes in Syria, but that expectation has hardly been fulfilled. There were in Syria a few Roman maps (East upwards), for example the world maps of EUSEBIOS and ST. JEROME (IVth century); there is the famous map of Mâdabâ (first half of VIth century), the T-maps of MOSES of CHORENE (first half of Vth century), and of MOSES BAR KEPHA (second half of IXth century), finally the map of BAR HEBRAEUS (second half of XIIIth century). Of course the latter is no longer a prototype, but on the contrary a result of Arabic influence. Thus the whole of Syriac cartography amounts to very little.

The history of Muslim cartography may de divided into three overlapping stages. The first stage (VIII-IX centuries) is the period of translation from the Greek sources and of adaptation of Ptolemaic knowledge to their own needs. It is represented by the four maps of AL-KHWÂRIZMÎ. The second stage (X to XIII centuries) is purely Muslim. It is essentially the result of the geographic efforts made by various Muslim communities for governmental purposes (establishment of regular communications for travelers and messages, administrative subdivisions of territories, taxation.) These efforts are summarized in a succession of geographical manuals and atlases, which being all of the same type (Kitâb al-masâlik wal-mamâlik), deserve to be considered collectively (MILLER calls the whole group « Islam atlas »). I shall come back to this presently. The third stage is the Norman-Arabic cartography, which was largely due to the patronage of ROGER II OF SICILY and promptly reached its climax thanks to AL-IDRÎSÎ's genius in the second half of the XIIth century.

I can now explain the plan of MILLER's vast undertaking, He has hardly dealt with the first stage; the study of AL-KHWÂRIZMÎ's geography has been very well begun by HANS VON MŽIK and is now being completed by him (see *Isis*, V, 208, and my *Introduction*, I, 564). His investigations are thus entirely devoted to AL-IDRÎSÎ on the one hand, and the « Islam atlas » on the other. His work will be divided into six volumes, as follows : I. Introduction. General maps, that is, Mediterranean maps of the « Islam atlas », and the two great maps of AL-IDRÎSÎ (1154, 1192); II, III and IV. Geographical analysis of the whole material arranged by countries as it is in the Islam atlas. The maps of that collection are compared for each country with AL-IDRÎSÎ's maps. Of course for non-Muslim countries, the latter are the only Muslim maps available, but this is not at all, as MILLER suggests, a proof of Muslim intolerance or even of indifference to the non-Muslim world : As the true Muslim

maps were dominated by administrative needs, it is natural enough that they were restricted to the Islamic world. Volume II will deal with Europe and Africa ; volume III with Western and Southern Asia; vol. IV with Armenia, Central and Eastern Asia. The fifth volume will contain facsimiles of the great Roger map of AL-IDRÎSÎ (1154), of the world map of AL-SFÂQSÎ (1592 or 1601) and of some forty smaller world maps Arabic, Persian and Syriac. Finally a sixth volume (Ergängzungsband) will contain complete photographs of the original manuscripts of AL-IDRÎSÎ's maps, 338 photos upon 138 plates.

I remarked at the beginning that Muslim maps ignored the occidental division into three continents. The maps of AL-IDRÎSÎ are divided latitudinally into seven climates, and longitudinally into ten sections. On the other hand, the maps of the « Islam atlas » are divided into geographical units, twenty one in number (a few of which may be lacking in some MSS.) as follows :

1. World; 2. Arabia; 3. Persian gulf (Baḥr Fârs), Arabian sea and desert; 4. Maghrib; 5. Egypt; 6. Syria; 7. Mediterranean (Baḥr Rum); 8. Jazîrah; 9. 'Irâq; 10. Khûzistân; 11. Fârs; 12. Kirmân; 13. Sind; 14. Adharbâyjân; 15. Jibâl; 16. Ṭabaristân; 17. Caspian sea (Baḥr Khazar); 18. The Great Desert (al-Mafâzah); 19. Sijistân; 20. Khurâsân; 21. Mâ-warâ-l-nahr (Transoxiana).

The maps of the « Islam atlas » were developed by the following geographers (I indicate after each name the date and the number of MSS. used by MILLER) : 1. AL-BALKHÎ (first half of Xth century; 3 MSS.); 2. AL-IṢṬAKHRÎ (second half of Xth cent.; 2 Arabic MSS. plus 5 MSS. ofPersian translation (2); 3. IBN ḤAWQAL (same time; no maps extant); 4. AL-MUQADDASÎ (same time; 2 MSS.); 5. AḤMAD AL-ṬÛSÎ (second half of XIIth century; 1 MS. in Persian); 6. IBN SAID OF GRANADA (second half of XIIIth century; 1 MS.); 7. NAṢÎR AL-DÎN AL-ṬÛSÎ (same time; 1 MS.). It is interesting to note that the greatest part of this material dates from the Xth century, which was indeed the golden age of pure Muslim geography (as distinguished from the Norman-Muslim geography of the XIIth century.). The author has used in all fifteen manuscripts not counting those of AL-IDRÎSÎ and his followers), containing 275 maps all of which will be reproduced and described in his Mappæ arabicæ !

At the time of writing this review (April 1927) I have seen 5 parts, dated 1926 : I, 1, a-b. General introduction and maps of the Mediterranean sea of the « Islam atlas » (13 in number); I, 2, a-b. AL-IDRÎSÎ's map of 1154. This includes an introduction dealing with AL-IDRÎSÎ's life and

(2) These five Persian MSS. of AL-IṢṬAKHRÎ form the largest sub-group of the «Islam atlas».

works, his sources, the MSS., his influence, and with the analysis of his map; I, 3. The smaller AL-IDRÎSÎ map of 1192. These two maps are not reproduced in facsimile (this will be done later as aforesaid), but reproduced schematically, all the names being transliterated. (One curious and disturbing feature of these maps, is that the southern part is upwards ; thus we would have to turn them upside down to recognize familiar outlines but then we can not read the names). Moreover the accompanying text contains an analysis of the maps country by country, al the names being quoted again with sundry variants and conjectures.

These transliterations from the Arabic or the Persian suggest my only criticism of an otherwise admirable undertaking. The author says that it would have been impossible for a single person to decipher the names of as many as 700 sheets, and that this work had to be accomplished by the cooperative efforts of many. Granted. But this does not entirely justify the lack of unity in the transliterations. I suspect that the author himself does not read Arabic. For example, the introductory essay spells the name of AL-IṢṬAKHRI in three different ways and as common a word as kitâb is misspelled (on p. 22) ḥitab. This is rather disquieting. But it may seem ungracious thus to critizice this splendid work. We are all deeply indebted to KONRAD MILLER, who is finally giving us the means of studying Muslim cartographer as a whole. May he live to see the successful termination of this his last achievement. GEORGE SARTON.

Edwin Tenney Brewster. — *Creation. A history of non-evolutionary theories.* 295 p., 30 pl. Indianapolis, The Bobbs-Merrill Co., 1927.

An excellent work by the same author, The Understanding of Religion (Boston 1923), was reviewed in *Isis*, VII, 162-165. The present work is an additional endeavor in the same direction, the author's fundamental purpose being to clarify some theologico-scientific issues. It is vain to discuss a subject which has not been clearly defined. The innumerable discussions of recent years on evolution *vs.* creation are good examples of such vanity. It occurred to the author that it would be useful to define the meaning of creation, which implied studying the history of creationist theories. HENRY FAIRFIELD OSBORN gave us years ago (1894) a history of evolutionary ideas entitled From the Greeks to DARWIN; BREWSTER thought that it would be worth while to supplement it by a history of non-evolutionary ideas, which might be entitled From the Jews to BRYAN, «There have been no fewer than five theories of creation that are so far incompatible with one another that no two ought to occupy the same mind at the same time. Unless one knows something about them all, and who has held which and when, and which — if any — the Bible teaches, one is hardly in a position to pass intelligently on various disputed matters.»

These five theories may be briefly defined as follows : 1. Spontaneous generation, which supposes an infinite number of fresh starting points for organic life; 2. Primitive special creationism, which supposes one only; 3. Catastrophic special creationism which supposes ten to one hundred; 4. Uniformitarian special creationism which supposes a million or two; 5. Evolution which involves none. » It would take too much space to follow the author in his history of the vicissitudes of these five theories. Indeed it is a very complicated history for these five theories did not supersede each other as they appeared, but coexisted to some extent and in various ways. The idea of spontaneous generation, which is the most primitive of all, held part of its ground until the time of PASTEUR, and in a sense it is not yet entirely eliminated : we know that life does not spontaneously begin under controllable conditions; every case of spontaneous generation has been proved experimentally to be apparent not real; yet we can not affirm that spontaneous generation will never occur under some conditions thus far unconceivable. As we do not know exactly how and when life originated, we can not exclude absolutely the contingence of its beginning even now.

The author shows very clearly that the various theories were for a long time unrecognized, and we may assume that the modern creationists have not recognized them yet : « All men in the ancient world, and all men down through the Middle Ages, believed in some sort of creation. But they all, along with this, believed also in some kind of evolution. Men did not, until lately, distinguish the two. The Bible, as we shall discover, teaches both, in the sense that in addition to an original « creation » there goes on all the while a transformation of various created beings into something else — dust into lice, rods into serpents, and the earth, vaguely, into creeping things and foreigners. » He also shows that Genesis I is, all things considered, good science; that is, it is a good statement of the problem of origins from the point of view of the positive knowledge obtained in those days. The Fathers of the Church, chiefly ST. AUGUSTINE, interpreting Genesis in the light of ARISTOTLE were evolutionists, but they were also creationists; they believed in a continuous creation that is always at the same time a creative evolution. Similar views were entertained by Muslim philosophers.

I cannot follow the author in all the intricacies of his story, but I note, down a few points which have arrested my curiosity. For example, there is a good account (p. 112-125) of the singular views of PHILIP HENRY GOSSE (1810-1888) as set forth in his « Omphalos, an effort to untie the geological knot » (London, 1857). The reader has probably some knowledge of those views, as I had myself, through the admirable autobiography written by PHILIP's son, Sir EDMUND (Father and Son, 1907).

Then (p. 132-136) there is a most interesting letter of March 1698 wherein the Welsh palæontologist EDWARD LHWYD (1660-1709) explained to JOHN RAY (1) his objections to the diluvial origin of fossils. In spite of the erroneousness of his conclusions, this LHWYD was a very good observer, endowed with considerable originality. He had managed to collect in Oxford, a good number of fossils — of which only one is extant ! One would like to know more about this LHWYD ! (2) The term evolution was introduced by the great Genevese naturalist CHARLES BONNET (1720-1793) in or about 1762. The primary acception was embryological, evolution (or pre-formation, emboitement) being opposed by BONNET to epigenesis. The development not only of embryos but of successive generations, is only an evolution, a rolling out. This reminds one of mediæval conceptions, for example of AL-NAẒẒÂM's theory (SARTON's *Introduction*, I, 559). The whole of mankind was hidden in Eve's womb. « Thus by a strange irony, evolution originally meant the most extreme imaginable form of creationism ! » A good part of the English translation of BONNET's work was annexed bodily in a work of his, by JOHN WESLEY, the founder of Methodism. BREWSTER discusses this, concluding « The only basis for the wide-spread opinion that WESLEY accepted organic evolution is WESLEY's obsession with the Ladder of Life and the confusing circumstance that BONNET himself called by the name Evolution the most thoroughgoing and uncompromised of all non-evolutionary systems. » He finally shows that it is a mistake to date the theory of evolution from the formulation by DARWIN and WALLACE of the principle of natural selection :

« For given BONNET's notion of created germs, everybody must see that the « evolution », in BONNET's sense, of individual from created germ, is the obvious type and pattern for the « evolution », still in BONNET's sense, of the whole organic world from its pre-formed and original creative source. So the germ, « evolving », becomes the type and pattern of the world. But BONNET's preformation breaks down and men learn that there is no evolution in his sense. Evolution, therefore, as a word in the dictionary, hangs in the air with no meaning, and animals and plants arise by epigenesis. But the idea is still in some men's minds of an evolution of the organic world that parallels the epigenesis of the individual. BUFFON and LAMARCK, along with others, work out this notion. Men become familiar with the evolution, in our modern sense, of

(1) The letter is quoted from RAY's Three physico-theological discourses.

(2) Or LHUYD. Some information will be found in the Dictionary of National Biography (vol 33, 217-219, 1893, by D. LLEUFER THOMAS) and in R. T. GUNTHER. Early science in Oxford (vol. 3, 1925; *Isis*, VIII, 377).

the individual as the type and pattern of the greater evolution throughout geologic time. »

I hope my review will induce many readers to turn to BREWSTER's book for the rest of his story, which is well documented, carefully thought out and clearly told. Though I was not hunting for them, I noticed a few slips, which I indicate briefly : p. 15, read loups garous (This is a strange word. Garou which means as much as loup-garou is derived from the L. L. gerulphus itself connected with the A. S. werewolf meaning man-wolf, lycanthrope); p. 111, GABRIELE FALLOPPIO was not a contemporary of LEONARDO DA VINCI, he was born only four years after LEONARDO's death, — so much the worse for him! ; p. 124, STRABON wrote in Greek; p. 267, read jeux d'esprit. Finally I would not choose the foundation of the Geological Society of London (in 1807) as the beginning of modern geology; true beginnings are always due to single men, such as JAMES HUTTON and WILLIAM SMITH in the present case, (3) not to societies. The creation of the Geological Society consecrated the new movement which was then well on its way.

I may add that this book is very pleasant to read and the reader's entertainment is enhanced by a set of well chosen illustrations. The fact that the author entitled himself « Member of the History of Science Society » though he could have quoted various other titles, much harder to win, is, I take it, a compliment to our young society which our members will not fail to appreciate. GEORGE SARTON.

Kurd Lasswitz (1848-1910). — *Geschichte der Atomistik vom Mittelalter bis* NEWTON. 2 Bände. 2. mit der ersten übereinstimmenden Auflage. XII+518 u. VIII+609 S. LEOPOLD VOSS, Leipzig, 1926 (Rm. 45).

Die 1. Auflage dieses Werkes, welche im Jahre 1890 erschien, ist hier wieder in genau gleicher Weise erstanden. Es ist eigentlich seltsam dass ein Buch, welches zu den fundamentalen Werken der Geschichte des Denkens gerechnet werden muss, so langer Zeit bedurfte, bis es zu einer neuen Auflage kam. Betrachtet man die Rezensionen, welche über die 1. Auflage geschrieben wurden, so findet man, dass diese meistens ungünstig lauten. Aus 2 Gründen : 1. weil der Vf. dort wo er eine eigene philosophische Meinung ausdrückt, von einem bestimmten neukantischen Standpunkte ausspricht und 2. weil seine eigenen physikalischen Ansichten mit den damals herrschenden im Gegensatz standen. Heute haben sich diese Anschauungen meist geändert, und überhaupt treten in der Tat die eigenen Meinungen des Vf. nicht in den Vordergrund

(3) See *Isis*, II, 359 etc.

Die guten Seiten des Werkes, welche ganz ausserordentliche sind, wurden damals viel zu sehr übersehen. Ich möchte gleich sagen, dass ich dieses Werk für eines der wichtigsten und zugleich besten wissenschaftgeschichtlichen Werke halte, die es gibt, und dass es nach meiner Meinung jeder ernsthafte Forscher in jeder Wissenschaft gelesen haben sollte.

Das Problem der Atomistik ist, wenn man es recht betrachtet das Zentralproblem aller erklärenden Naturwissenschaft überhaupt. Daher kommt es, dass wir in diesem Werke eine sehr grosse Reihe der wichtigsten Fragen aus dem Gebiete der rationalen Naturerklärung neben der Atomistik behandelt finden. So besitzen wir in diesem Buche eigentlich auch eine Geschichte der Begriffe Substanz, Materie und Form, Veränderlichkeit, Geist und Aether, des Problems der Kontinuität, des Gesetzes von der Erhaltung der Materie, der Elemente und der Masse, des Begriffes des leeren Raumes, sowie die Geschichte mancher chemischer Grundbegriffe, wenigstens von einigen Seiten aus.

Vf. beginnt mit der Atomistik der Mittelalters. Die des Altertums ist in Einschiebungen behandelt, was vielleicht zu bedauern ist. Eine gute Einführung in die Physik des ARISTOTELES ist darunter. Die Darlegung über die Physik der Mutakallimun ist die ausführlichste, die wir im deutschen Schrifttum haben. Wertvoll ist auch die Behandlung der jüdischen und arabischen Philosophie des Mittelalters. Das 2. Buch wendet sich der Erneuerung der Corpusculartheorie zu. In trefflicher Darstellung wird gezeigt, wie der Begriff formbestimmender Eigenschaften sich nach und nach ersetzt durch den Begriff der unveränderlichen Substanz. Wenn dabei LASSWITZ öfter von « Denkmitteln » spricht, was ihm öfter zum Vorwurf gemacht wurde, so verstehen wir das heute besser. Wir finden im 3. Buche den philosophischen Ausbau der Corpuscular-Theorie. LASSWITZ gibt eine überaus reichhaltige und feine Analyse der Physik des GALILEI, DESCARTES, des GASSENDI, DIGBY und HOBBES. Hier und da merkt man an kleinen Stellen, dass die neuen Forschungen von P. DUHEM, WIELEITNER u.a. noch nicht vorhanden waren, als das Buch geschrieben wurde. Im 4. Buche schildert er das, was für ihn die « Naturwissenschaftliche Vollendung der Corpuscular-Theorie» bedeutet. Diese besteht für ihn in der rein kinetisch-mechanischen Theorie der Materie von HUYGENS. Mit dem Uebergang zu den Fernkräften NEWTONS beginnt für LASSWITZ die dynamische Theorie der Materie, die ihm als ein Rückschritt erscheint. Die Darlegungen über JOACHIM JUNGIUS, ROBERT BOYLE, BORELLI, HOOKE und namentlich HUYGENS sind Musterbeispiele klarer und systematischer Darstellung. Im letsten 5. Buche « Der Uebergang zur dynamischen Theorie der Materie » gibt LASSWITZ die Geschichte der Umwandlung des Kartesianismus, der Lehre SPINOZAS, LEIBNITZens

und anderer um schliesslich mit einer Geschichte der Attraktionshypothesen bei NEWTON zu landen, mit dem das Werk schliesst. In der Attraktion sieht LASSWITZ eine Mystik, deren Erklärung ihm unmöglich erscheint. Aber der Vf. ist so objektiv, trotzdem sich von diesen Anschauungen in seiner wissenschaftlichen Darlegung nicht beeinflussen zu lassen. Er zeigt vielmehr (II, 360) selbst die Schwäche der HUYGENSschen Lehre, welche darin besteht, dass er keine Erklärung geben kann, durch welche Kräfte die kleinen Teilchen, welche die Attraktionswirkung ausüben, selbst in sich zusammengehalten werden. Auch die früher genannten persönlichen Ansichten des Vf. haben keinerlei wirkliche Einwirkung auf seine Darstellung. Wen wir uns denken, dass der gleichen Zeit und ungefähr demselben neukantischen Gedankenkreise wie dieses Werk auch ALB. LANGES Geschichte des Materialismus, F. ROSENBERGERS schöne Geschichte der Physik, EMIL WOHLWILLS Werk über GALILEI entsprungen ist, — um nur die wichtigsten zu nennen dann können wir sagen dass diese Auffassung für die Forschung in der Geschichte der Wissenschaften sicher nicht von Nachteil war. Gewiss aber kann diese Anschauung den rationellen Elementen in der Forschung besser Rechnung tragen als dies dem Empirismus möglich ist.

Möge der Mut des Verlages, dieses fundamentale Werk wieder dem Käufer zuganglich zu machen, durch ein starkes Interesse der Käuferwelt belohnt werden.

(*München*). HUGO DINGLER.

Hélène Metzger. — *Les concepts scientifiques*. Préface de M. ANDRÉ LALANDE. 195 p. Paris, ALCAN, 1926.

Le mémoire de Mme METZGER auquel nous faisions allusion dans un numéro précédent (IX, 116) est enfin publié. Il doit son origine à une question mise au concours par l'Académie des Sciences morales : « Développer sur un point important la théorie logique des classifications, esquissée dans les Aperçus de taxinomie générale de DURAND DE GROS » (1899). Le problème que s'est posé l'auteur est très clairement énoncé dans l'introduction :

« Par quels procédés divers, notre esprit parvient-il spontanément et sans volonté préconçue à ranger dans la même classe les choses présentant entre elles des ressemblances superficielles ou des analogies profondes ? Ce n'est donc pas une théorie concernant la logique des classifications que nous allons traiter ici; notre ambition plus modeste se bornera à préciser la nature des démarches intellectuelles qui, indépendamment de tout raisonnement conscient, nous permettent de considérer sinon comme identiques, du moins comme semblables par quel-

que côté, comme appartenant au même genre, des objets pourtant différents. »

Les travaux d'histoire des sciences de Mme METZGER sont bien connus de nos lecteurs. Elle a collaboré plus d'une fois à notre journal (voir *Isis*, IV, 466-82; VIII, 427-464; etc.), et ses livres : Le genèse de la science des cristaux, 1918, et Les doctrines chimiques en France du début du XVIIe à la fin du XVIIIe siècle, 1923, y ont été longuement analysés (*Isis* III, 445; VI, 57-64). Le présent mémoire se rattache directement à ces travaux plus purement historiques, quoi qu'il en diffère profondément par la forme. Mais le fait est que l'auteur est plutôt philosophe qu'historienne. Sous l'influence d'EMILE MEYERSON et de son propre tempérament, ce qui l'intéresse surtout c'est la valeur explicative des développements historiques. Elle se rend bien compte cependant que les explications de l'histoire sont à la fois insuffisantes et incertaines, mais n'en est-il pas de même de toutes nos explications? Il faut savoir nous satisfaire de la petite part de vérité qui nous soit vraiment accessible. En écrivant ce mémoire, elle n'a fait qu'employer d'une manière nouvelle sa très riche documentation sur l'histoire des sciences, et particulièrement sur l'histoire de la chimie.

Son analyse est subdivisée comme suit : « I. Concepts fondés sur la ressemblance : 1. De l'analogie virtuelle. 2. De l'analogie formelle. 3. De l'analogie agissante. II. Concepts fondés sur la permanence de substances : 1. Substance commune définissant le genre, substance particulière, l'espèce. 2. Mêmes substances en divers états ou proportions. 3. Substances diverses exerçant des fonctions semblables. III. Les concepts d'évolution, leurs différentes formes : 1. Evolutions parallèles. 2. Evolutions divergentes. 3. Evolutions convergentes. IV. L'interprétation des concepts par le « nominalisme scientifique » : 1. Abstractions par épuration. 2. Abstractions par indétermination. »

Il est impossible de la suivre ici dans le détail de son exposé, mais ce que j'en ai dit suffit à indiquer le haut intérêt de ce livre pour ceux qui s'intéressent à la philosophie ou à la psychologie des sciences.

Encore un mot. Je ne suis pas bien sûr que nos lecteurs et ceux de Mme. METZGER connaissent le livre de DURAND DE GROS qui a servi de point de départ à ce travail; et même je ne suis pas sûr qu'ils connaissent du tout cet auteur. Puisque Mme. METZGER ne l'a pas fait, il me semble utile de donner les renseignements suivants. JOSEPH PIERRE DURAND (dit DURAND DE GROS, alias A. J. P. PHILIPS) naquit à Gros près de Rodez (Aveyron) en 1826. Il commença des études médicales à Montpellier, mais pris dans la tourmente révolutionnaire, il dût s'expatrier en 1851. En Angleterre il apprit à connaitre les théories « électrobiologiques » importées d'Amérique, et s'en fit le propangandiste sous le nom de

PHILIPS. Plus tard il se rendit aux Etats Unis où il compléta ses études médicales. Il rentra en France, après l'amnistie, en 1860. Il a écrit beaucoup d'articles et d'ouvrages se rapportant à l'hypnotisme, la biologie générale, la philologie, la philosophie des sciences, etc. On peut le considérer comme un des précurseurs de l'Ecole de la Salpétrière. Je cite ses publications principales dans l'ordre chronologique :

1855. Electro-dynamisme vital. XLVIII + 383 p. Paris, BAILLIÈRE.

1860. Cours théorique et pratique de braidisme ou hypnotisme nerveux. XII + 180 p. Paris, BAILLIÈRE.

1862. Principe des propriétés organoleptiques. (ex *Annales médico-psychologiques*, Paris). 32 p.

1866. Essais de physiologie philosophique. XXIV + 595 p. Paris, BAILLIÈRE. (Ceci est le premier travail qui parut sous son propre nom; les trois premiers étaient signés PHILIPS.)

1868. De l'hérédité dans l'épilepsie (*Annales médicopsychologiques*, t. 12, Paris). 15 p. De l'influence des milieux sur les caractères de race chez l'homme et chez les animaux. 60 p. (*Procès verbaux de la Soc. d'anthropologie*) La philosophie physiologique et médicale à l'Académie de médecine. 100 p. Paris, BAILLIÈRE. Polyzoïsme ou pluralité animale chez l'homme. 16 p. Paris, HENNUYER.

1871. Ontologie et psychologie physiologique. XIV + 363 p. Paris, BAILLIÈRE. Les origines animales de l'homme. VIII + 157 p. Paris, BAILLIÈRE.

1894. Le merveilleux scientifique. 344 p. Paris, ALCAN.

1895. Coup d'œil rétrospectif sur diverses questions anthropologiques (*Bull. Soc. d'anthropologie*, Paris, 157-84).

1899. Aperçus de taxinomie générale. 267 p. Paris, ALCAN.

1900. Nouvelles recherches sur l'esthétique et la morale. 277 p. Paris, ALCAN. Variétés philosophiques. 2e éd. revue et augmentée, XXXII + 333 p. Paris, ALCAN.

1901. Questions de philosophie morale et sociale. XXXV + 179 p. Paris, ALCAN.

Cette liste imposante basée sur les catalogues de la Bibliothèque Nationale et de la Harvard Library, n'est pas complète, mais elle est suffisante pour indiquer les grandes lignes de l'activité de DURAND DE GROS. Elle permet de distinguer au moins quatre périodes dans sa vie scientifique : la période PHILIPS, passée en partie à l'étranger, et consacrée à l'électrobiologie. Une deuxième période de 1866 à 1871 (environ) pendant laquelle son horizon s'élargit mais reste restreint à la biologie. Puis

après plus de vingt ans de silence, une période finale où son horizon s'étend à toute la philosophie. C'est vers la fin de cette période et de sa vie (il mourut en 1900) que DURAND publia les Aperçus de taxinomie générale. Une étude d'ensemble sur la vie et l'œuvre de ce savant irrégulier, de ce penseur original et généreux, serait fort désirable. (1)

GEORGE SARTON.

Emile Meyerson. — *Identité et Réalité.* XIX+571 p. in-8. 3me édition. *Bibliothèque de philosophie contemporaine.* FELIX ALCAN, Paris, 1926 (40 Fr.).

Les écrits de M. MEYERSON jouissent aujourd'hui d'une telle notoriété que toute personne s'intéressant à la théorie de la connaissance scientifique lit et médite longuement l'œuvre de ce profond penseur. Nous avons parlé de ses deux derniers ouvrages lors de leur apparition [voir *Isis*, IV, 382-5 et VII, 517-20]. Un traité *De l'explication dans les sciences*, dans lequel l'auteur, en utilisant comme en se jouant une érudition extraordinairement riche, établit (avec autant de force persuasive que de conviction), que, contrairement aux préjugés positivistes encore à la mode, le savant dans un effort continu, sans cesse récompensé mais jamais victorieux aspire au véritable savoir ; il veut comprendre le réel, ou ce qui revient au même en dernière analyse, assimiler le monde entier à sa pensée. *La déduction relativiste* où M. MEYERSON étudiant psychologiquement, pourrait-on dire, les travaux de M. EINSTEIN et de ses disciples, montre que les nouvelles doctrines que le vulgaire juge au premier abord paradoxales ou absurdes, ne sont pas des monstruosités scientifiques comme certains détracteurs l'ont affirmé ; mais, par contre, elles ne bouleversent pas aussi profondément notre méthode de connaître que quelques adeptes enthousiastes l'ont proclamé ; comme la physique classique à laquelle elles tendent à se substituer, ces théories, M. MEYERSON le démontre victorieusement, cherchent en suivant le schéma tracé par l'auteur bien avant leur apparition à remplir « le programme éternel de la science de toujours. »

Or, une nouvelle édition du premier travail d'épistémologie de M. MEYERSON (publié pour la première fois en 1907), *Identité et Réalité*, vient de paraître et peut-être n'est-il pas trop tard pour saisir cette occasion et donner un compte-rendu de ce livre bien connu.

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(1) Des renseignements biographiques sont probablement contenus dans la brochure suivante : L'instruction secondaire, discours prononcé par M. J. P DURAND (DE GROS) avec son portrait et un avant propos des éditeurs. 33 p. Paris, ALCAN, 1891 ; — et peut être aussi, dans la préface aux Questions de philosophie morale (1901) par D. PARODI. Je n'ai pu consulter ces deux ouvrages.

C'est en étudiant les admirables travaux sur l'histoire de la chimie dûs à la plume de son maître HERMANN KOPP, que M. MEYERSON a été amené à prendre nettement conscience des problèmes qui, depuis lors, n'ont cessé d'être l'objet de ses méditations. C'est notamment en cherchant à reconstituer quelle fut la pensée scientifique des écoles prélavoisiennes que l'auteur aperçut que les anciennes théories (prises pour des enfantillages par nombre de personnes), contiennent cependant les rudiments d'une véritable science, notre chimie actuelle ; qu'entre cette science périmée et la science de nos jours, il était possible de trouver un dénominateur commun qui permit de passer de l'une à l'autre ; que, par exemple, STAHL, comme LAVOISIER et les savants modernes, expliquait les propriétés les plus variées, les plus fugitives des corps par la persistance de substances indestructibles, invariables, toujours semblables à elles-mêmes.

Dès que M. MEYERSON entrevit clairement la conclusion vers laquelle tendait son enquête sur l'évolution de la chimie, il a considérablement étendu le champ de ses réflexions ; généralisant alors le problème dont une solution particulière l'avait frappé, il s'est proposé (p. IX), « suivant un programme tracé, mais non réalisé par AUGUSTE COMTE de parvenir *a posteriori* à connaître les principes aprioriques qui dirigent notre pensée dans son effort vers la réalité » ; pour atteindre ce but, il ne s'est plus contenté d'étudier les travaux des chimistes ; la science tout entière, ancienne, moderne, contemporaine, fut appelée à témoigner, l'auteur la considérant « comme la matière brute du travail, comme un spécimen saisissable de la pensée humaine et de son développement. »

Pour mener à bien cette audacieuse entreprise, il fallait un savoir encyclopédique et un sens critique aiguisé. M. MEYERSON possède l'un et l'autre ; nous n'allons pas encore une fois vanter son érudition universelle ; signalons seulement avec quelle sagacité il a su éviter un écueil sur lequel son travail risquait dès le début de se heurter. Quelques-uns des savants les plus éminents ont, on le sait, tenté de préciser soit dans leurs ouvrages, soit au cours de polémiques retentissantes, quelle est en général la marche de la pensée scientifique, quel est le rôle de l'hypothèse et par suite quelle est la signification de la science, quelle est sa valeur de *savoir*. Et les affirmations de maîtres justement respectés ont servi de point de départ aux philosophes construisant une théorie de la Connaissance ; mais, observe à diverses reprises M. MEYERSON, est-ce dans ces déclarations bien connues dont la sincérité est hors de doute que se révèle la volonté profonde du chercheur? En d'autres termes, le savant, même le grand savant est-il un bon psychologue? Sonde-t-il avec justesse sa propre pensée? Un examen approfondi montre qu'il n'en est pas toujours ainsi, et que pour ne s'exposer à aucune er-

reur, il faut chercher à travers les lignes de l'œuvre scientifique elle-même ce que le savant a demandé à la science.

Est-il vrai, demande M. MEYERSON, que comme COMTE et MACH l'ont affirmé, la science ne soit édifiée que dans un dessein d'action et de prévision? Est-il vrai que le savant se contente de connaître les lois qui régissent les phénomènes sans se soucier de chercher à pénétrer l'intimité de ces phénomènes? L'œuvre des savants bien examinée, montre, au contraire, que l'idéal positiviste que l'on a voulu parfois imposer artificiellement à leurs travaux ne saurait satisfaire entièrement leur conscience; la science veut parvenir à la clarté complète en expliquant les faits dont l'empirisme a déterminé l'ordre de succession; pour comprendre cet ordre, notre esprit ne peut procéder qu'en identifiant l'antécédent et le conséquent, et cette tendance primordiale engendre les théories atomiques, puis les principes de conservation, soit de la vitesse et de l'inertie, soit de la matière, soit de l'énergie, préparant ainsi l'élimination du temps. Mais la science ne veut pas seulement expliquer le *devenir* ; elle cherche aussi à expliquer l'être et aspire à l'unité de la matière en assimilant celle-ci à l'espace indifférencié dont tous les points sont équivalents et indiscernables ; si elle parvenait au bout de cette voie, elle aboutirait à l'annihilation du monde extérieur ; la réalité cependant résiste à la contrainte de notre raison, et cette résistance trouve son expression la plus générale dans le principe de CARNOT, dont la dissymétrie ne peut par aucun moyen être déduite du mécanisme. L'explication scientifique se heurte donc à l'intérieur même de la science à un irrationel qu'elle n'assimile pas complètement.

La place nous manque pour suivre pas à pas les démarches de la pensée de M. MEYERSON. Une analyse même plus complète ne saurait d'ailleurs suppléer à la lecture du texte d'*Identité et Réalité*, que ce trop bref compte-rendu invite à connaître davantage.

L'ouvrage est suivi d'un index alphabétique des matières qui facilitera grandement les recherches des travailleurs.

(*Paris*). HÉLÈNE METZGER.

Paul Tannery (1843-1904). — *Mémoires scientifiques* publiés par J. L. HEIBERG et H. G. ZEUTHEN. VI. Sciences modernes (1883-1904), édité par GINO LORIA, XXIV + 608 p., 4 planches. Toulouse, EDOUARD PRIVAT, 1926.

Nous venons à peine de publier une analyse du volume VII (*Isis*, IX, 127-30) et déjà voici un nouveau volume. Grace à la piété de MADAME TANNERY, cette publication unique se continue donc avec une constance admirable. Depuis 1912, quand le premier volume parut, nous avons

été tenus presque tout le temps en haleine. Presque chaque tome d'*Isis* a contenu la critique de l'un ou de l'autre volume. Nous avons presque l'illusion que PAUL TANNERY est encore parmi nous ; ce n'est là hélas ! qu'une illusion.

Ma seule critique, c'est que le classement des mémoires de chaque volume (dans l'ordre chronologique de publication), est une cause de désordre plutôt que d'ordre. Il brise l'unité de l'œuvre; on accentue l'émiettement au lieu de l'atténuer. Pour en sentir toute l'absurdité, il suffit de se dire ceci. Un auteur préparant une œuvre assez étendue n'en compose pas toujours les différentes parties dans l'ordre le plus logique, mais dans l'ordre matériellement possible, ou le plus commode. Il arrive même qu'il publie certaines de ces parties à mesure qu'elles sont prêtes, et dans l'ordre où elles le sont. Cela est fort bien. Mais que penserions nous de lui, si l'œuvre complète était finalement publiée, non pas dans son ordre logique et naturel, mais dans l'ordre (ou plutôt le désordre) imposé par les hasards de la composition et les nécessités de l'existence ? Le fait que l'œuvre de TANNERY est incomplète, ne justifie pas une autre méthode qui en accentue inutilement la nature fragmentaire. Au contraire, il aurait fallu essayer de reconstituer autant que possible l'œuvre que TANNERY lui-même aurait sûrement complétée s'il avait vécu. Je me hâte d'ajouter que Madame TANNERY n'est nullement responsable de la méthode adoptée! celle-ci a été fixée par les premier éditeurs qui ont simplement obéi à la loi du moindre effort.

Conformément à mon habitude, je rétablirai dans mon analyse l'ordre naturel des fragments. Cela me dispensera d'ailleurs d'analyser longuement chacun d'eux; c'est déjà une analyse fort utile pour nos lecteurs, que de les remettre à leur vraie place. Ce volume est consacré presque uniquement aux mathématiques, mais il contient quelques notes relatives à l'astronomie et la mécanique. De plus, la plus grande partie se rapporte au XVIIe siècle, à l'époque de FERMAT et de DESCARTES, dont TANNERY avait fait une étude si approfondie. On pourrait dire en effet que sa vie fut principalement dévouée à l'étude de la science grecque et des mathématiques dans la première moitié du XVIIe siècle. Ces deux grands sujets sont d'ailleurs étroitement liés. FERMAT continue DIOPHANTE, DESCARTES continue PAPPUS. Mais revenons en à l'analyse de ce volume, analyse nécessairement brève à cause de sa richesse. Sans doute trouvera-t-il beaucoup plus de lecteurs que les volumes précédents, car les questions qui y sont traitées intéressent plus directement les mathématiciens.

Première moitié du XVIe siècle.

Histoire de la résolution des équations cubiques (1901, p. 361-367). Discussion d'une note d'EDUARDO SAAVEDRA suggérant une origine arabe

aux découvertes des algébristes italiens. TANNERY était plutôt porté à rattacher ces découvertes à l'influence diophantine.

Articles GIROLAMO CARDANO (p. 503-506) et LUIGI FERRARI (p. 544) dans la *Grande Encyclopédie*.

Première moitié du XVIIe siècle.

La part du lion est naturellement donnée à DESCARTES et à FERMAT Enumérons donc tout d'abord les Mémoires qui leur sont consacrés.

DESCARTES. — Une lettre inédite de DESCARTES à MERSENNE (1866. p, 31-33). Neuf lettres inédites *idem* (1891, 119-136.) Deux nouvelles lettres *idem* (1892, 137-140). Encore trois lettres *idem* (1892, 141-148). La correspondance de DESCARTES dans les inédits du fonds LIBRI; étudiée pour l'histoire des mathématiques (1893, 149-268). Les lettres de DESCARTES (1896, 287-303). DESCARTES physicien (1896, 305-319), ceci est une défense intéressante des aptitudes expérimentales du grand métaphysicien. Les Excerpta ex M. SS. R. DES-CARTES (1899, 323-359); il s'agit des fragments publiés à la fin des Opuscula posthuma (Amsterdam 1701). Un mot sur DESCARTES (1903, 415-423). Sur une erreur mathématique de DESCARTES (1904, 441-456); à propos de la chute des graves et des règles du choc. Pour l'histoire du problème inverse des tangentes (1904, 457-477); ce problème fut soulevé dans une lettre adressée par DESCARTES à FLORIMOND DEBEAUNE le 20 février 1639; cette lettre ne parait point avoir circulé avant 1667. Article sur la Géométrie de DESCARTES dans *la Grande Encyclopédie* (p. 530-536).

Ces études réparties sur une période de près de vingt ans, forment un ensemble imposant, qui complète l'édition de DESCARTES à laquelle TANNERY avait consacré tant de soins. Il est intéressant de rapprocher cette nouvelle publication cartésienne de celle qui nous a été donnée récemment par LEON ROTH (Oxford 1926; *Isis*, IX,. 434-437).

FERMAT. — Sur la date des principales découvertes de FERMAT (1883, 1-18) : FERMAT est un bel exemple de génie associé à la jeunesse; son activité la plus féconde eut lieu de 1636 à 1641 (Ae. 35-40). Sur un problème de FERMAT (1886, 35-40). Les manuscrits de FERMAT (1889, 41-77). Article dans *la Grande Encyclopédie* (540-544).

DESARGUES. — Sur un opuscule de DESARGUES (1890, 115-118) : un très rare exemplaire de la Perspective de 1636. Article dans *la Grande Encyclopédie* (527-530).

GIRARD. — ALBERT GIRARD, de Saint Mihiel (1883, 19-22). Etablissant son origine lorraine; Saint Mihiel est sur la Meuse entre Verdun et Commercy.

PASCAL. — PASCAL et LALOUVÈRE (1889, 79-114). Au sujet de la discussion sur la cycloide entre PASCAL et le jésuite toulousain

ANTOINE DE LALOUVÈRE « En résumé, aucun reproche sérieux ne peut être fait à PASCAL dans toute cette affaire; il a porté, à la vérité, contre LALOUVÈRE, des accusations injustes, car, en somme, celui-ci avait une méthode qui lui suffisait parfaitement pour résoudre les problèmes proposés, et c'était là le nœud de la question, puisque, pour le prix, le jésuite n'y prétendait pas. Mais les soupçons conçus à tort par PASCAL sont amplement motivés par l'insigne maladresse des agissements de LALOUVÈRE, et d'autre part ce dernier n'était pas un calculateur assez soigneux pour pouvoir toujours tirer de sa méthode trop complexe des résultats dont il fût assuré. Une erreur de calcul est toujours pardonnable, mais ce qui ne l'est pas, c'est qu'un mathématicien ne sache pas vérifier ses calculs. LALOUVÈRE en était incapable; c'est ce qui le condamne définitivement; il ne devait pas concourir. » Seconde note sur la même question (1894, 259-279).

DEBEAUNE, FLORIMOND de (1601-1652). — Article BEAUNE dans *la Grande Encyclopédie* (485-486). TANNERY a découvert plus tard que l'orthographe DEBEAUNE est plus correcte.

CHAUVEAU. — Sur le mathématicien français CHAUVEAU (1895, 283-286). Mathématicien peu important cité par HUYGENS, DESCARTES, etc.

MERSENNE. — Voir les lettres citées à propos de DESCARTES. Je rappelle à cette occasion que la correspondance de MERSENNE que TANNERY avait projeté d'éditer sera publiée bientôt par les soins de C. DE WAARD et de Mme. TANNERY.

GALILÉE. — GALILÉE et les principes de la dynamique (1901, 387-413). Lettre à PIERRE DUHEM sur son mémoire De l'accélération produite par une force constante (1904, 479-483). Article dans *la Grande Encyclopédie* (545-551).

CAVALIERI. — Article dans *la Grande Encyclopédie* (514-517).

Note sur des lettres de la Hofbibliothek de Vienne (373-384)

Seconde moitié du XVIIe siécle.

HUYGENS. — Article dans *la Grande Encyclopédie* (565-567)

BROUNCKER, WM. (1620-84). — *Idem* (499-500).

BERNOULLI, JACQUES I et JEAN I. — *Idem* (486-493).

CASSINI, JEAN DOMINIQUE (1625-1712). — *Idem* (506-510).

Commercium epistolicum. — *Idem* (525-526). Il s'agit à la fois du recueil de WALLIS (Oxford 1658) et de celui de JOHN COLLINS (Paris 1712).

Note sur les manuscrits français de Munich et de Vienne (1901, 369-384).

Première moitié du XVIIIe siècle.

Serie d'articles écrits pour *la Grande Encyclopédie* sur : DANIEL BERNOULLI ; JACQUES CASSINI; CÉSAR FRANÇOIS CASSINI (dit DE THURY) CLAIRAUT.

Seconde moitié du XVIIIe siècle.

Idem : JACQUES DOMINIQUE CASSINI; LAGRANGE.

Première moitié du XIXe siècle.

Idem : MICHEL CHASLES; K. G. J. JACOBI.

Seconde moitié du XIXe siècle.

Idem : BALD. BONCOMPAGNI; MORITZ CANTOR; GEORG CANTOR.

Mathématiques.

Note sur la théorie des ensembles (1884, 23-30). Sur l'histoire des mots analyse et synthèse (1903, 425-440). Articles de *la Grande Encyclopédie* : ensemble; géométrie; mathématiques; postulat; quadrature. Pour la mécanique, voir GALILÉE, *supra*.

Ce volume est orné de deux beaux portraits de FERMAT et DESCARTES et de facsimiles de leur écriture. Mme. TANNERY y a ajouté plusieurs notes intéressantes. Il me faut encore signaler une assez longue liste d'errata (607-608). Ce livre est tout à fait indispensable pour l'histoire des mathématiques dans la première moitié du XVIIe siècle.

GEORGE SARTON.

Franz Boll (1867-1924). — *Sternglaube und Sterndeutung*. Die Geschichte und das Wesen der Astrologie. Unter Mitwirkung von CARL BEZOLD (1859-1923). Dritte Auflage nach des Verfassers Tod herausgegeben von W. GUNDEL, XII + 211 S., mit 48 Abbildungen im Text und auf 20 Tafeln sowie einer Sternkarte. Leipzig, TEUBNER, 1926. (Mk. 11).

The first edition of this work appeared in 1917; the second, including many corrections, in 1919. This second edition was reviewed in *Isis*, III, 482. The main text of the third edition is essentially the same, but it has been considerably enlarged by additions (p. 85-172), some of which suggested by BOLL himself, and by a series of appendices (p. 173-205).

The divisions of the main text were indicated in my first review. I shall mention here only the titles of the appendices : Die Texte der Laienastrologie. Die lateinische Astrologie des Mittelalters. Eine neue Liste der Dodekaoros. Wozu diente die Tabula Bianchini? Weltperioden und Planetenlauf... The number of illustrations, has also been in-

creased from 20 to 48. The series of illustrations collected upon 20 plates at the end of the volume is very interesting indeed; see for example the figures relative to *paranatellonta* and *dodecaoros*. This wealth of illustrations is largely due to the collaboration of the Warburg Library of Hamburg (*Isis*, VI, 236), which is responsible for this new enlarged edition. It is worth while to recall that the book itself owes its existence at least partly to A. WARBURG's initiative, for it reproduces a course of lectures delivered in 1913 in Hamburg.

I know no better introduction to the scientific study of astrology than BOLL's book. To be sure it is only a sketch, but a sketch by a master's hand. It contains the essential and is informed throughout not only with a deep knowledge of the facts but what matters as much with a generous spirit of sympathy and understanding. The new edition is a credit to GUNDEL's industry, but the printing of such a large volume of notes at the end of the text is irritating to a degree.

The publication of an English translation is very desirable. This publication ought to be made or directed by a competent and tactful scholar who would incorporate some of these notes into the text, or at any rate bring them nearer to it at the foot of each page. Many of the notes ought not to be included at all. Of course there is no end to note making, for each topic brings to each mind some additional illustrations, and each topic is correlated with a variety of others and so forth. A scholar's mastery reveals itself in the ability to stop at a fixed point and not to press the whole of his knowledge on the reader.

It is sad to think that neither of the two authors lived to see the appearance of this much enlarged edition of their work. FRANZ BOLL, born in 1867, died in July 3, 1924. See KARL MEISTER. FRANZ BOLL und die Erforschung der antiken Astrologie. *Neue Jahrbücher für wissenschaft und Jugendbildung* (1925, 321-330, with portrait and bibliography). CARL BEZOLD, born in 1859, died in August 1923. See bibliography of his writings, compiled by his wife ADELE BEZOLD, in *Zeitschrift für Assyriologie* (Bd. 35, 57-72, 1923, with portrait). GEORGE SARTON.

Abel Rey. — *Le retour éternel et la philosophie de la physique*. 320 p. Paris, FLAMMARION, 1927. (12 frs.)

The author of this work, our learned colleague of the Sorbonne, is too well known by many studies on the philosophy of science to need a long introduction to our readers. It will suffice to recall the titles of his main works : La théorie de la physique chez les physiciens contemporains, 1907; a new edition of the first part appeared in 1923 (*Isis*, V, 484); L'énergétique et le mécanisme au point de vue des conditions de la connaissance, 1908; La philosophie moderne, 1908; Les sciences

philosophiques et leur état actuel, 1911. He has been especially interested for a long time in the recurring conflict between the purely mechanical and the energetical theories. Physicists will readily guess that the subject of the present, his latest, work is that selfsame conflict as evidended by the history of thermodynamics. He first discusses the principle of conservation of energy, then CARNOT's principle and CLAUSIUS's elaboration of it. The notion of the growth of entropy seems to destroy the age old belief in the eternal return or recurrence of things, a very tenacious belief which has been shared alike by philosophers and ignorant people, by the wise and the fool of all times. The author's main purpose is to determine the true meaning of that belief. To quote his own words : « Nous voulons chercher à quoi correspond dans la réalité l'idée de retour éternel, si elle est une exigence de l'esprit, seulement, une exigence des choses, seulement, une adaptation de l'esprit aux choses, ou enfin la double exigence de l'esprit et des choses. Non, qu'elle soit je ne sais quelle mixture des choses et de l'esprit dans une emprise réciproque; mais une loi du réel, ce réel primordial d'où procèdent à la fois le sujet et l'objet, l'esprit et les choses, et que nous appellerons faute de mieux l'univers du réel. »

But to come back to the plan of his work. After having explained the apparent destruction of that belief by the very triumph of thermodynamical conceptions, he proceeds to show how the cinetic theory of gases, and such experimental facts as the Brownian movement seem to open a way of escape. The truth is that a belief as deeply rooted in the soul of man, can not be destroyed; it can be knocked out but only for a time. Nor is MAXWELL's demon needed for his reappearance. The second law of thermodynamics is a statistical law; it is not as absolute as the first law; it rules out certain events not as impossible but as extremely improbable. And what matters improbability in the face of eternity? Mr. REY enlarges upon all this at considerable length, winding up his argument with two chapters entitled respectively : Metaphysics of the eternal return; Realization of the eternal return!

It is difficult to know for which group of readers this book was written. The author's insistence upon elementary facts suggests that he tried to bait the general reader; but many other parts are far too technical to give any satisfaction to that illusive public. On the other hand physicists will be irritated by his diffuseness. The prolixity of such a work is more or less unavoidable. The translation of physical facts and theories into ordinary language involves necessarily circumlocutions which obscure the subject. But aside from that the author has a natural tendency to verbosity which cannot but annoy and discourage English readers.

Mr. REY has defined the philosopher as « the historian of contempo-

rary scientific thought » (*Isis*, v, 484); he has also claimed that the philosophy of science is the central point of view of the history of science (*Isis*, viii, 339). These assertions, especially the latter, are disputable. I believe that the history of science is primarily the history of science and not something else. Of course every subject lends itself to philosophical considerations, but it seems wiser to study the subject first, and philosophize afterwards to the extent that we have deserved it by our humble and austere efforts. The philosophy of a subject is the legitimate reward of good workmen, at regular intervals — not too near and yet not too distant — or else it is worth very little. These remarks must be understood as applying not so much to the present work as to Mr. Rey's views in general. He seems to have made a deep and prolonged study of thermodynamics. Yet the fact remains that he is an incurable philosopher, and I am affraid that the history of science is to him nothing but a vast treasury of pegs whereupon to hang his endless disquisitions.

George Sarton.

Edgar Fahs Smith. — *Old chemistries*. xi + 89 p., 31 plates. New York, Mc Graw-Hill Book. Co., 1927. ($ 2.50)

This charming volume was not written primarily for scholars but for chemists and I am sure it will do them a lot of good. It is just the sort of book which may awaken their historical curiosity and stimulate it; it might be called a historical « catalyzer ». I can easily imagine a « potential » historian of chemistry reading it and finding in it his first inspiration. It is written mainly from the American point of view, laying stress on American chemists or on books which influenced directly the development of American chemistry. Though composed in a light and familiar vein, it may interest scholars because of some valuable documents inserted in it. I am thinking for example of a remarkable letter which Lavoisier sent to Franklin on February 2, 1790, together with two copies of his chemical treatise. The book is richly illustrated with a number of portraits and facsimiles.

However its main interest lies less in its substance than in the personality of its author. Dr. Smith, late Provost of the University of Pennsylvania, and much beloved of the alumni who have erected a life size statue of him on the campus, may be counted one of the pioneers of the History of Science movement in the United States. The study of the history of chemistry has been the main hobby of his very active life, and he has been one of the very first college professors to think it worth: while to teach the history of his knowledge. He says in the Preface , « The author's hope is that sometime — how soon he knows not — but sometime — the history of chemistry will be given its place in the cur-

riculum of studies in every institution of learning where the science itself is studied; for it is, indeed, a very comprehensive subject. » I need hardly endorse that hope, for it is my very life. But I would go one step further and say, I hope that some day no master's degree will be given to a student unless he has shown he is somewhat familiar with the history of his special field of study. I do not believe that such decision would be a panacea but I am sure it would help to restrain the materialistic tendencies of scientific students, it would give them a last chance of becoming professional scientists without losing interest in the historical, literary and artistic aspects of life.

The appearance of this handsome volume gives me a good opportunity of recalling Dr. SMITH's previous contributions to the history of chemistry. I must limit myself of course to the most important of them. Here they are : Chemistry in America (370 p., New York 1914); The life of ROBERT HARE, 1781-1858 (516 p., Philadelphia 1917); JAMES WOODHOUSE, 1770-1809 (299 p., Philadelphia 1918); Chemistry in old Philadelphia (106 p., Philadelphia 1919; *Isis*, III, 464); JAMES CUTBUSH, 1788-1823 (94 p., Philadelphia, 1919; *Isis*, V, 238); PRIESTLEY in America, 1794-1804 (173 p., Philadelphia, 1920; *Isis*, IV, 418); SAMUEL LATHAM MITCHILL (24 p., New York, 1922); JACOB GREEN, 1790-1841 (34 p., Philadelphia, 1923); JOHN GRISCOM, 1774-1852 (27 p., Philadelphia, 1925; *Isis*, VIII, 566). For minor publications, see *Isis* by indices.

GEORGE SARTON.

J. Chaine. — *Histoire de l'anatomie comparative.* VI+461 pp. E. DAGUERRE, Bordeaux, 1925.

A l'heure actuelle, où chacun reconnaît que toutes les sciences sont sœurs, et que l'esprit humain n'a divisé les phénomènes naturels en disciplines que pour mieux les étudier, il est étrange de voir paraître un livre comme celui-ci. En effet, CHAINE part de la conception que l'anatomie comparative est une science par elle-même, qui a plus de rapports avec la métaphysique qu'avec les sciences connexes.

C'est ainsi que, pour expliquer sa citation de LUCRÈCE dans ce livre, il dit (p. 95) : « ... l'Anatomie comparative ne se borne pas à l'étude des organes, toute sa partie philosophique est d'ordre purement spéculatif ; elle raisonne sur les résultats fournis par la comparaison des parties, sur des idées ou même des hypothèses suggérées par des faits constatés par soi ou par d'autres. C'est pour cela qu'un philosophe non anatomiste peut fort bien réussir dans cette partie. »

De même (p. 171) : « DESCARTES... peut être ainsi considéré comme un des initiateurs de l'Anatomie comparative, bien qu'il ne se soit jamais occupé de cette science. » Ceci pouvant paraître surprenant au premier

abord, nous citerons encore ce que dit CHAINE pour justifier sa façon de voir (p. 172) : « DAREMBERG, cependant, ne reconnaît pas l'influence de DESCARTES sur l'Anatomie. Ni VESALE, ni HARVEY, écrit-il, n'ont attendu DESCARTES pour réformer l'anatomie ou transformer la physiologie ; après DESCARTES les grands anatomistes, les grands physiologistes et les grands cliniciens ne paraissent pas s'être beaucoup souciés ni du *Traité de l'homme*, ni de celui du *fœtus*, ni des *Lettres* ; ils n'ont même ressenti que très indirectement l'influence du *Discours de la Méthode*. Il y a là une exagération incontestable. Il est évident qu'en tant qu'anatomiste et physiologiste l'influence de DESCARTES fut à peu près nulle ; mais c'est surtout comme *penseur* que son action s'est exercée et d'une façon bien efficace quoiqu'en ait dit DAREMBERG. »

Un tel raisonnement nous donne un livre sur l'histoire de l'anatomie comparative où sept pages sont consacrées à FRANCIS BACON et vingt-quatre lignes à MARCELLO MALPIGHI, trois pages à LOCKE et rien à MONRO le jeune et JOHN HUNTER parce que (p. 229) « Leurs travaux, bien que certains soient reconnus comme fort importants et à juste raison, ne sont, en effet, que de la pure Zootomie, rien de plus. » Ceci ne devient compréhensible que si on adopte le principe, dont part CHAINE, que l'anatomie comparative est (p. 129) « ... une science, faite toute de raisonnement. »

Si les anatomistes sont ainsi relégués à un plan inférieur, les physiologistes n'en peuvent que souffrir davantage. C'est ainsi que la découverte de la circulation du sang est relatée en une note (p. 136) d'une ligne et demie. Et CHAINE dit de FABRICE D'ACQUAPENDENTE (p. 145) : « ... il est à remarquer que le but poursuivi par FABRICE était plutôt d'éclairer la physiologie que de déterminer la constitution organique même... Ce qui explique que le raisonnement n'était pas d'une nécessité absolue dans ses observations. »

Un grand nombre de philosophes sont cités — les deux BACON, HOBBES, GALILÉE, LÉONARD DE VINCI, MALEBRANCHE, LOCKE, NEWTON, LEIBNIZ, HUME, KANT, FICHTE, SCHELLING, HEGEL, etc., etc., Ils occupent une place énorme dans cette histoire de l'anatomie comparative, comme ils pourraient naturellement en occuper une, si l'on suivait le raisonnement de CHAINE, dans l'histoire de n'importe quelle science, que ce fût la chimie ou la géographie. Leurs œuvres n'ont d'ailleurs pas été lues par l'auteur, puisqu'il les cite par l'intermédiaire de diverses histoires de la philosophie et études spéciales françaises.

Je ne m'arrêterai pas à décrire ce que dit CHAINE de la grande époque de l'anatomie comparative, au début du dix-neuvième siècle. C'est conçu dans le même esprit que le reste de son étude, laissant une place prépondérante à des généralisations spéculatives, et ne parlant des faits concrets que très secondairement.

Dans ce gros livre, pas une figure, et presque rien sur la vie et les conditions de travail des anatomistes et philosophes cités. Pas un mot, non plus, sur l'embryologie et la morphologie expérimentales, et pas d'aperçu sur l'avenir de l'anatomie comparative, si ce n'est qu'il faut continuer dans l'ancienne voie de dissection et de spéculation.

Personne ne doute de la portée philosophique de l'anatomie comparative, et notamment de son rôle, avec l'embryologie et la paléontologie, comme appui de la théorie de l'évolution. Mais CHAINE nous donne un aperçu de l'anatomie comparative, à la fois divorcée de toute autre science, et hautement spéculative, telle qu'elle n'a jamais été. L'anatomie comparative est un moyen dans les recherches biologiques ; elle n'est pas un but en soi.

(*Paris.*) RAOUL M. MAY.

Lucien Lévy Bruhl. — *L'âme primitive*, II + 451 p., *Bibliothèque de philosophie contemporaine*. FÉLIX ALCAN, Paris, 1927.

(50 fr.)

Depuis de nombreuses années, M. LÉVY BRUHL s'efforce de comprendre la psychologie au premier abord si étrange, des nombreuses races et peuplades que notre orgueil de « civilisés » qualifie assez improprement de sauvages, d'inférieures ou de primitives. A l'aide d'une documentation extraite des meilleures descriptions publiées par des voyageurs, missionnaires, fonctionnaires ou autres coloniaux, qui ont le mieux connu les tribus habitant le pays de leur résidence, il a mis en lumière le fait suivant qui avait échappé à l'attention de ces observateurs sagaces : que l'esprit des primitifs, au lieu de s'engager spontanément dans la voie que notre usuelle logique semble avoir tracée au développement naturel de la pensée, suit dans la majorité des cas une route extrêmement différente, que le philosophe doit tout d'abord s'efforcer de connaître.

Cette proposition d'apparence paradoxale que M. LÉVY- BRUHL avait d'abord considérée comme une simple « hypothèse de travail » a été amplement vérifiée et mise hors de doute dans les deux ouvrages suivants qui sont rapidement devenus classiques et sur lesquels nous ne devons pas aujourd'hui nous appesantir : *Les fonctions mentales chez les sociétés inférieures* (ALCAN, 1911, in-8) et *La mentalité primitive*. (ALCAN 1921, in-8) (voir *Isis* v, 467).

Rappelons cependant que l'auteur de ces deux livres est parvenu à décrire approximativement et pour ainsi dire de l'extérieur la marche que suit la pensée primitive, ignorante ou dédaigneuse des distinctions nettes et tranchées auxquelles les démarches conceptuelles de notre pensée nous ont habitués; pour elle, et d'une manière qui nous paraît incompréhensible, les objets, les êtres, les phénomènes peuvent être à la

fois eux mêmes et autres chose qu'eux mêmes; ils peuvent s'identifier partiellement ou complètement avec d'autres objets, d'autres êtres, d'autres phénomènes apparemment très différents et parfois fort éloignés.

Cependant ce procédé de pensée à première vue absurde ou au moins étonnant ne se connaît pas lui-même et n'est jamais utilisé pour fournir une vision statique ou contemplative que le primitif ne saurait même concevoir; l'interprétation des faits suscitée à chaque occasion par son application semble être partie intégrante de la perception de ces faits. Les choses auxquelles cette mentalité prête pour ainsi dire vie ne restent jamais inertes, et d'une manière que nous ne pouvons comprendre, « elles émettent et reçoivent des forces, des vertus, des qualités, des actions mystiques qui se font sentir hors d'elles sans cesser d'êtres où elles sont ».

C'est que le primitif est pour ainsi dire plongé dans un océan de puissances mystiques, bienfaisantes ou malfaisantes, ennemies ou amies, qu'il s'efforce sinon de connaître, du moins de capter par des pratiques magiques ou par des incantations, surtout de ne pas s'aliéner en oubliant une cérémonie importante ou en violant un interdit ou *tabou;* le monde extérieur auquel nous sommes habitués, celui de notre expérience sensible ne représente pour lui que l'affleurement d'un univers psychologique ou émotif dans lequel sa pensée se meut familièrement ! De là une grande quantité d'affirmations ahurissantes, de jugements apparemment contradictoires, que la critique ne peut atteindre parce qu'ils sont directement *sentis* ou *perçus* comme réels; de là le caractère *prélogique* des conceptions les plus hétérogènes que les missionnaires et les voyageurs ont signalé sans pouvoir les interpréter chez les peuplades inférieures et que M. Lévy Bruhl est parvenu à ranger sous un point de vue unique en disant que la pensée des primitifs est régie par *la loi de participation* : entendant par là que chaque être en effet, par sa nature et son action,prend *part* à un autre être dont on affirme cependant l'identité avec lui même.

Que le schéma abstrait que nous venons de tracer soit véritablement celui que suit spontanément l'esprit des peuples inférieurs, c'est ce dont les nombreux exemples qui enrichissent les ouvrages mentionnés plus haut nous avaient déja convaincus; mais c'est aussi ce dont il sera désormais impossible de douter quand nous aurons lu *l'âme primitive* où M. Lévy Bruhl avec un talent que lui envieraient maints romanciers, parvient en quelque sorte à faire vivre du dedans les hommes dont il a pris à tâche de reconstituer la véritable mentalité.

La première chose que nous avons à dire sur *l'âme primitive* — les esprits chagrins seront libres de voir en cet éloge un blâme, mais tant pis pour eux — est que ce livre qui nous instruit certes beaucoup en nous

invitant à réfléchir, fait cela en nous amusant, en nous égayant, en entretenant notre bonne humeur; il nous arrive d'oublier un moment que l'auteur est un savant qui nous enseigne sa science, pour nous réjouir sans arrière pensée de toutes les histoires de sauvages qu'il a bien voulu nous conter, et grâce auxquelles nous pénétrons sans effort dans un milieu physique et psychique grouillant d'une vie spontanée intense, éblouissante, sans rapport, semble-t-il, avec l'univers calme et tranquille auquel nous sommes habitués.

Ce n'est pourtant pas uniquement pour faire passer quelques bons moments à ses futurs lecteurs que M. Lévy Bruhl a réuni en un volume tant d'anecdotes pittoresques extraites des ouvrages compacts des voyageurs; ces récits « parlants » pour ainsi dire sont destinés à nous permettre de saisir sur le vif sans l'intermédiaire d'aucun appareil scientifique, quel est le ressort profond qui anime l'esprit des primitifs;et bien entendu ces faits ne sont pas disposés d'une manière quelconque et sans ordre; ils doivent nous montrer la place que tient l'homme individuel, sa personnalité, son âme dans les représentations des peuplades inférieures.

Il n'y a jamais eu, il ne pourrait y avoir de « philosophe sauvage » spéculant abstraitement ou théoriquement sur l'âme humaine, sachant isoler cette âme de celle des autres hommes, et du monde extérieur formant le cadre dans lequel il nous faut bien vivre; aucune chose pour les primitifs n'est appréhendée isolément, et l'être humain ne saurait être considéré autrement que comme un objet placé au milieu d'autres objets qui participent à sa nature, comme il participe à la leur. Pour le *dynamisme* des primitifs, circule sans arrêt une force simple ou multiple, matérielle et spirituelle tout à la fois, qui passe constamment d'une chose à une autre, se réfractant ou se multipliant à travers les divers objets, et qui, il faut l'ajouter, est sentie comme réalité immédiate, non conçue à la réflexion comme substance universelle.

De ce fait primordial résultent nombre de conséquences sur lesquelles nous ne pouvons nous étendre et dont nous indiquerons brièvement quelques unes; d'abord le primitif ne se conçoit pas indépendamment du groupe social auquel il est incorporé et auquel il participe, comme ce groupe participe à lui même; cela se reflète bien souvent dans la construction de son langage et dans ses croyances les plus diverses; sa solidarité avec les membres de sa famille peut même devenir physiologique et il est parfois astreint à recevoir des soins quand l'un des siens est malade. etc...

Le primitif ne limite pas comme nous son individu à son corps; tout ce qui l'a touché de près ou de loin en reste partie intégrale, la trace de ses pas, les habits dont il s'est couvert, les restes de ses aliments et bien

d'autres choses encore deviennent mystérieusement lui même et peuvent agir à sa place; réciproquement un ennemi qui se serait emparé de ses « appartenances » selon l'expression de M. LÉVY BRUHL pourrait les ensorceler et par leur entremise tuer celui dont elles font partie.

Le primitif place parfois dans une partie du corps, qui peut être blessée et abimée d'une manière mystique sans qu'aucune lésion anatomique vienne le révéler, le siège de l'âme ou de la vie; quand un nègre des régions australiennes croît qu'un sorcier s'est emparé de sa « graisse des reins », il se juge condamné, et s'abandonne sans résistance à son mauvais sort; parfois aussi ce principe de vie est transporté hors du corps dans une région inaccessible, semble-t-il, à l'assaillant, et devient ce que l'on a appelé d'une manière pittoresque « l'âme extérieure ».

Le primitif croit que pendant qu'il continue de vivre humainement, de vaquer à ses occupations habituelles, d'être en compagnie de ses amis, il peut cependant s'incarner dans le corps d'un animal; s'il prend la forme d'une bête féroce, tigre, lion, léopard ou crocodile, il peut terroriser son village; et cependant si cet animal dangereux qui est son double vient à être tué, le nègre meurt subitement! La lycanthropie que M. LÉVY BRUHL dépeint d'une manière si pittoresque joue un très grand rôle dans les croyances des peuplades inférieures.

Enfin la mort du primitif ne met fin qu'à la vie terrestre; du moins y a-t-il constamment interférence entre l'autre monde et celui-ci; comme le vivant, le mort peut avoir une double ou multiple présence, être le cadavre, une part du cadavre, prendre la forme d'un ou de plusieurs lions, serpents ou autres animaux; enfin se réincarner dans ses descendants ! La plupart des peuples dits sauvages ont un grand respect pour les petits enfants, que jamais ils ne contrarient, car ils croient que les enfants sont littéralement leurs grands parents ou tout autre ancêtre.

N'insistons plus sur ces choses dont il est impossible de donner en quelques lignes la vision; *l'âme primitive* se révèle à travers le livre de M. LÉVY BRUHL, sur lequel nous voulons seulement attirer l'attention et dont rien ne remplace la lecture. Mais il nous faut encore faire une remarque importante: s'il est vrai que M. LÉVY BRUHL a étudié la psychologie des sauvages sans aucune autre intention que de la bien connaître, les résultats de son enquête doivent poser des problèmes fort importants à de nombreux savants consacrant leurs efforts à des travaux apparemment fort différents des siens; nous ne mentionnerons qu'un exemple pour montrer sa richesse suggestive, laissant le soin d'en trouver d'autres aux lecteurs de *l'âme primitive*.

L'historien des sciences ou celui qui aspire à donner une théorie des progrès de la connaissance scientifique devra rechercher si vraiment la *loi de participation* a disparu de la pensée civilisée, ou bien si *refoulée*

constamment par la critique logique à l'arrière fond de nous même, elle ne serait pas inspiratrice d'un grand nombre d'hypothèses nouvelles que la science a rejetées après un examen sévère, ou qu'elle s'est incorporées à elle même, parvenant ainsi à découvrir sur le monde quelque point de vue nouveau (1). Nous livrons ce sujet de méditation à ceux que *l'âme primitive* intéresse. HÉLÈNE METZGER.

Max Neuburger. — *History of Medicine*. Translated by ERNEST PLAYFAIR, M. B., M. R. C. P. In two volumes. Vol. I. 1910, vol. II., Part. I. 1925, pp. 1-135. HUMPHREY MILFORD, Oxford University Press.

NEUBURGER began to publish this well known History of Medicine twenty years ago. The field of antiquity and medicine in the Middle Ages was adequately covered within a short space of time. Due primarily to the efforts of the late Sir WILLIAM OSLER, an English translation of the first volume, dealing with ancient medicine and mediæval medicine in the East, was promptly published in 1910. NEUBURGER unfortunately has not completed the work, his attention having been engaged by the history of early Viennese medicine and biographical studies of great clinicians connected with Vienna at their height, e. g. NOTHNAGEL. His *Geschichte* thus makes a halt with the fifteenth century. Meanwhile the English edition has been brought up to the chronological limit of the German, leaving the reader in mid-air.

The first volume of the work is too well known to need discussion and thus most of my attention will be devoted to the second. In the original it is truly a masterful work we have before us : picturing the emergence of crude concepts, following them systematically and gradually into the *milieux* of various civilizations, maintaining always the two guiding thoughts essential to historical writing. Developments are treated in continuity and they are set into the background of general history and *Kulturgeschichte* with which they admirably blend. The groundwork is laid in tracing the unity of Prehistoric (rather pre-literary) and Primitive, Mesopotamian, Egyptian, Indian, Chinese and Prehistoric American healing craft. The whole volume is an uninterrupted story leading to the survey of the medical heritage of Antiquity. The recent volume continues the same method of exposition and develops medicine in its general setting to the Renaissance.

In the presentation of a History of Science and particularly a History

(1) En nous excusant de nous citer nous même, nous devons avouer que ce sont les travaux de M. LÉVY BRUHL qui nous ont inspiré la théorie de *l'Analogie agissante*. Voir *Les concepts scientifiques* p. 35, et *Isis*, IX, p. 467-70.

of Medicine, I would lay emphasis on seven distinct aspects, or rather attempt to bring out seven distinct approximations to a pragmatic description of the occurences. These are : 1) The interaction between the general level of civilization in the particular age treated and its scientific achievements. Civilization enables the advancement of science, science on the other hand, directly or indirectly promotes progress in other fields of endeavor, as the scientific attitude toward history would have it. I hasten to say that this is NEUBURGER's method in handling his material and the strongest point in the work. 2) Proof of the gradual crystallization of concepts. 3) The development of scientific method. 4) The purposes with which intellectual activities were invested. 5) The rising development of intellectual coöperation. 6) The evolution of humane ideas, an altruistic thought which plays or at least, should fundamentally play, a rôle in medical history. 7) The continuity of teaching and learning. A composite and thorough stereoscopic picture could be obtained only by focusing every one of these « telescopes » — whose fields of vision, of course, overlap to a certain extent — upon the period. NEUBURGER, as said before, highly does justice to the first and also to the second one, but pays less attention to the others.

In the history of any phase of mediæval intellectual life it is perhaps never too late or never too frequent to emphasize the reasons for the aprioristic tendencies. They are all too well explicable, through the metaphysical bent of the mediæval mind. Although the antiquated ideas concerning the infringing attitude of the Church on freedom of thought are not much talked of amongst serious students, it is happy that the author should repeat the argument — the book after all is not meant for mediævalists. But then, why use such ambiguous expressions as « profound contempt for realities » in the Schoolmen? (p. 60.) Has it not been said : « *nihil est in intellectu quod non prius fuerit in sensu* »? Reality after all should be a technical philosophical term — particularly when one speaks of metaphysics — and to charge thoroughgoing Aristotelians and « realists » with a « contempt for realities », is, at least, carelessness or, purely, a colloquialism.

Certain curious interpretations catch the eye, despite the really sound scholarship with which the work was conceived and executed. This remark concerns chiefly the treatment of Salerno. According to the author, Salerno was the only mainstay of sound empiricism, of the Hippocratic tradition when the West was flooded with dogmatic Arabism. It is not very easy to see such a great difference between Salerno and other schools, particularly if, — which is not done either here or in other histories — *a strict chronological parallelism* is observed. Certainly, in the dark and obscure beginnings when Salerno in many ways was filled

with folklore and direct influences of ancient therapeutics (of DIOSCORIDES e. g.) — in the balmy days of ALPHANUS, before the advent of CONSTANTINE — yes, there might have been empiric, though unsystematic lore. This was the tenth and eleventh century and where were the other schools then? *In utero temporum*. Then comes CONSTANTINE, with him his Corpus, ABU JAFAR AHMED, the Viaticum, ISAAC etc., the Malikî, (1) — what I call « palæo-Arab » learning (« less exaggerated degree of Arabism » according to NEUBURGER, a not quite precice and felicitous expression.) After GERARD OF CREMONA comes AVICENNA, comes the Hâwî, comes AVERROËS — the dogmatic « neo-Arabism » — promptly taken up by the great French Universities; but then, in the thirteenth century Salerno was eclipsed. Salerno and Montpellier, or let alone Paris were not parallel developments !

There is practically no mention of Salernitan surgery — as we are already speaking of Salerno —, the antiquity of the *Regimen Sanitatis* is not as hoary as represented, and the Trotula myth (riddled by SPITZNER, SINGER and others) (2) is still upheld. These are certainly defects in the otherwise scholarly texture. — Exception must be taken also to the statement (p. 115) that first anti-plague regulations were effected by Venice in 1374. There is, on the contrary, ample evidence of such measures during the great epidemic of 1348. (3)

After all, these are not serious troubles. The serious thing with the book is its translation. Practically all the concise and important descriptions of sources have been left out in the translation and other illustrative examples cut unrecognizably short — the reader's attention never being called to these arbitrary cuts which reduce the book to not much more than half of the original's scope ! Outside of this basic defect, the style is cumbersome and stilted and at places incorrect renderings are used. Is « *impedimenta* » e. g. the right word for « Handwerkszeuge », tools, implements? (I. 8.) There is no uniformity in the mediæval

(1) D'IRSAY, S., Teachers and Textbooks of Medicine in the Mediæval University of Paris. *Ann. Med. Hist.* VIII, 234, 1926.

(2) SPITZNER, H, R., Die Salernitanische Gynäkologie und Geburtshilfe unter dem Namen « Trotula », Leipzig 1921.

SINGER, C. The origin of the medical school of Salerno; Essays in the History of Medicine presented to K. SUDHOFF, (ed. SIGERIST, Zürich 1924.

SINGER C, and SINGER, D., The School of Salerno. History, X, 242, 1925.

(3) LAURENTIUS DE MONACHIS, Chronicon de rebus Venetorum..., in MURATORI, Rer. Ital. Script. VIII. p. 137.

MONTICOLO, G., Cronache veneziane antichissime, Roma 1890.

S. ROMANIN, Storia documentata di Venezia, Venice 1853 (repr. 1912), III, p. 155.

BRUNETTI, Venezia durante la peste 1348, *Ateneo Veneto*, 32, 1909 *et. al. loc.*

spellings and some of them are again incorrect, e. g. « St. Victoire » for St. Victor (the Abbey.)

Added to this comes a major disadvantage, i. e. the lack of references, bibliographical notes (which particularly hamper the otherwise excellent section on the « Historical Survey of Literature ».), and another one, the absence of an index. The book, as I repeat again, is an outstanding achievement of medico-historical scholarship, but the last two features (or rather lack of features) combined with what has been said before, diminish the value of the English edition for scholars in a very marked degree.

(*New York City.*) STEPHEN D'IRSAY.

André Cresson. — *Les courants de la pensée philosophique française.* 2 vol., 208 + 212 pp. in-12, collection ARMAND COLIN, PARIS 1927. (Fr. 14)

L'auteur de cet excellent livre a voulu tracer un tableau, clair, vivant, accessible à tous les esprits cultivés, de l'évolution de la pensée philosophique française depuis la Renaissance jusqu'à nos jours; il n'a pas eu la prétention d'écrire un ouvrage d'érudition apportant aux savants quelques documents inédits ou peu connus. Cependant le travail de M. CRESSON mérite de retenir l'attention même de ceux à qui il ne pourra que rafraichir quelques souvenirs de choses depuis longtemps étudiées; bien que modestement présenté, il dépasse par un effort original de synthèse aussi bien les manuels pour étudiants que les essais de haute vulgarisation.

M. CRESSON pense que la légende bien connue de l'apprenti sorcier est un merveilleux symbole du mouvement de la pensée française depuis le XVI^e^ siècle jusqu'aux heures contemporaines. L'esprit philosophique n'a-t-il pas avec MONTAIGNE, DESCARTES et quelques autres invoqué l'esprit critique et le droit au libre examen qui délivrent de superstitions grossières et permettent de fonder la science sur de nouvelles bases, avec la même allégresse que le jeune magicien qui, en l'absence de son maître, prononça la parole miraculeuse dont il avait surpris le secret et qui contraignit le docile balai à nettoyer la maison à grande eau? L'esprit philosophique une fois déchaîné n'a-t-il pas comme le balai magique continué automatiquement son œuvre, et tout en rendant de grands services à la science, tenté de saper dans leurs fondations mêmes, non seulement le cartésianisme qui contenait encore des concessions à la tradition, mais encore les convictions morales, les croyances religieuses et l'armature qui paraissait intangible de l'ordre social. Les idées de VOLTAIRE, de ROUSSEAU, de CONDILLAC, de D'HOLBACH, et des encyclopédistes qui sont une émanation de cet esprit philosophique

n'ont-elles pas provoqué le grand bouleversement que fut la Révolution? Le souvenir de la Révolution a plus tard effrayé le philosophe comme l'inondation montante a terrorisé l'apprenti sorcier; le philosophe n'a plus voulu confondre son effort avec la volonté de conquête du libre examen; comme l'apprenti sorcier il a vainement pris à tâche d'arrêter l'essor d'une puissance qu'il avait lui même créée et qui menaçait de tout détruire; quelques uns avec LAMENNAIS et de BONALD ont cherché à tuer l'esprit critique; d'autres avec VICTOR COUSIN et les éclectiques ont tenté de lui faire sa part, d'autres encore avec COMTE et les positivistes ont voulu lui faire fixer par son propre effort ses limites, et ont cru pouvoir l'enfermer dans la science, etc....

Nous ne pouvons songer ici à suivre M. CRESSON dans sa promenade à travers l'histoire. — Nous le féliciterons sincèrement d'avoir remis à sa vraie place la belle œuvre si riche de pensée de BUFFON qui est généralement inconnue ou dépréciée. — Nous ne lui apprendrons rien en lui disant que sa thèse si franche, si nette n'aura pas l'adhésion de tous; mais elle mériterait d'autant mieux d'être prise en considération et au besoin d'être réfutée par ses adversaires, que M. CRESSON l'a étendue à la marche générale de la pensée moderne dont la pensée française n'est qu'une partie. — Enfin nous conseillerions au lecteur désirant avoir un aperçu plus complet des doctrines des philosophes actuels, que l'exposé de M. CRESSON décrit d'une manière très schématique et sommaire, de lire l'ouvrage de M. D. PARODI qui le renseignera à merveille : *la philosophie contemporaine en France* (1). HÉLÈNE METZGER.

(1) Bibliothèque de philosophie contemporaine. 3e éd. rev. et augm. d'un appendice, VI + 537 p., ALCAN, Paris, 1925. La 1e édit. est de 1919.

Twenty First Critical Bibliography

of the

History and Philosophy of Science and of the History of Civilization

(*to October* 1926)

This Twenty First Bibliography contains 769 items. Some of the notes were contributed by T.L. DAVIS (Cambridge, Mass.), HUGO DINGLER (Munich), L. GUINET (Brussels), L. LEROUX (Paris), R.M. MAY (Paris), J. STEPHENSON (Edinburgh), N. TRANSEHE (New York), H. WIELEITNER (Munich), J.K. WRIGHT (New York).

An authors' index will be found at the end. For general information on this undertaking see the Prefaces to the Sixteenth and Eighteenth Bibliographies, in *Isis*, VII, 171-174, 1925 ; VIII, 526-528, 1926.

In this bibliography for the first time each century is divided into two half centuries. As the chapters dealing with the sixteenth to nineteenth centuries are already subdivided into five sections, in order not to increase too much the number of sections, matters concerning the whole of these centuries are classified together with those which concern only the first half.

The reader will notice that the whole material is now divided into 181 sections. Thus any one having taken the small trouble of studying this classification, will be able to find rapidly the items which interest him most. It is hardly necessary to remind him that there are always a number of items which might be classified in different ways. Therefore it is wise to read not only the section in which one is directly interested but also the neighboring sections. For example a student of the Galilean period ought to read not only the section dealing with the first half of the XVIIth century; but also those dealing with the second halves of the XVIth and XVIIth centuries.

Apocryphal works of uncertain dates are generally classified, for the reader's convenience, as if they were original works of the author to whom they are ascribed.

The present bibliography contains a list of every article and review published in volume VIII and also the third series of errata and addenda to my *Introduction to the History of Science*, vol. 1, from HOMER to OMAR KHAYYAM (Carnegie Institution, Washington, 1927).

The ultimate aims of this undertaking are : (1) to establish the History

of Science as an independent discipline ; (2) to demonstrate inductively the Unity of Knowledge and the Unity of Mankind ; (3) to serve as a center of information and rallying ground to the scholars engaged in our studies. I can not succeed entirely without their assistance, and they can help me in many ways. To serve them, as well as I can, is both my duty and my pleasure. Critical work must be approached in a spirit of service or left untouched.

Harvard Library, Room 185. GEORGE SARTON.
Cambridge, 38, *Massachusetts*. *October* 24, 1926.

PART I

Fundamental Classification (centurial)

IXth Century B.C.

Herrmann, Albert. Die Bedeutung HOMERS für die griechische Geographie. *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*, p. 171-196, maps, 1926. ISIS

The geographical ideas which actually find expression in the Iliad and the Odyssey form a mosaic of fragments dating from widely differing ages. HERRMANN makes an ingenious attempt at a reconstruction of the progressive development of geographical knowledge throughout the period of six centuries which elapsed between the earliest and latest versions of the Homeric poems. J. K. W.

VIIth Century B. C.

Sidersky, D. L'inscription hébraïque de Siloé. Essai bibliographique. *Revue archéologique*, vol. 19, p. 117-131, 1924. ISIS

See also *Journal Asiatique*, 1918 (*Isis*, 4, 573).

VIth Century B. C.

Franke, Otto. Der geschichtliche KONFUZIUS. *Zeit. d. deutsch. morgenl. Ges.*, N.F., vol. 4, p. 163-191, 1925. ISIS

A sketch of the sources of our knowledge of CONFUCIUS and of the results of criticism. While the Confucian system is of immense importance, an independent criticism sets but slight value on the personality of CONFUCIUS himself. The system is not the work of CONFUCIUS, as orthodox tradition would have us believe, but is the consciously and systematically fostered result of the political development since the Han period and of certain factors of social psychology. Confucianism is an ethical-political institution which arose long after CONFUCIUS; owing to misleading tradition, the two have been placed on the same level, and the importance of the one measured by that of the other. J. S.

Vth Century B. C.

Schrader, Hans. PHIDIAS. 384 S., 325 Abb. Frankfurt a. M. Frankf. Verl.-Anst., 1924. ISIS

Reviewed by GEORG LIPPOLD, *Deutsche Literaturzeitung*, 1402-1405, 1926.

IVth Century B. C. (second half)

Ehrenberg, Victor. ALEXANDER und Aegypten. (*Beiträgen z. Alten Orient*, hrsg. v. W. SCHUBART, H. 7.) 58 S. Leipzig, J. C. HINRICHS 1926. ISIS

Hovgaard, William. The arsenal in Piraeus and the ancient building rules. *Isis*, 8, p. 11-20, 2 pl., 1926. ISIS

Apropos of the so-called Arsenal Inscription of 347 B. C. found in 1882 in Piræus and chiefly apropos of VILHELM MARSTRAND's technical study of it, 1922. G. S.

Jaeger, Werner (Wilhelm). ARISTOTELES: Grundlegung einer Geschichte seiner Entwicklung. Berlin, Weidmannsche Buchhandlung, 1923. ISIS

Marstand, Vilhelm. Arsenalet i Piraeus og oldtidens byggeregler. En teknisk, matematisk, arkitektonisk, skibsbygningsteknisk, topografisk, filologisk, historisk og aestetisk undersogelse. 288 p. illust. (30.5 × 22.5 cm.) Copenhagen, ASCHEHOUG, 1922. ISIS

Analysed by WILLIAM HOVGAARD in *Isis*, 8, 11-20, 1926. G. S.

Montalenti, Giuseppe. Il sistema aristotelico della generazione degli animali. *Rassegna di Studi Sessuali e di Eugenica*, 6, 113-139, 1926. ISIS

Philipp, Hans. ALEXANDERS indischer Feldzug und die Geschichte der Erdkunde. (*Griech.-lat. Lesehefte z. Kultur d. Altertums*, hrg. v. H. PHILIPP, H. 4.) 32 S. 5 Karten. Frankfurt a. M., M. DIESTERWEG, 1925. ISIS

Stéphanidès, Michel. *Ὁ Ἀριστοτέλης ὡς φυσιοδίφης* (Aristote physicien). *Ἐπιστημονικὴ Ἐπετηρὶς τῆς Σχολῆς τῶν φυσικῶν καὶ μαθημ. ἐπιστημῶν*, vol. 1, p. 111-314, 1925. ISIS

L'auteur expose ses idées sur les œuvres et la méthode physique d'ARISTOTE et notamment il indique (cf. l'article du même auteur dans la *Revue Scientifique* 1924, p. 626, *Isis*, 7, 178) que le *φυσικῶς θεωρεῖν* de la Physique aristotélique ne signifie pas seulement une recherche basée sur l'observation, elle implique aussi que le physicien ne doit considérer comme chose ou phénomène naturel que ce qui se réalise en effet dans la Nature, c'est-à-dire sous les indispensables conditions naturelles. Ainsi p. ex. ARISTOTE, bien qu'il fut le premier inventeur (voir *Isis*, 3, 430) du principe de l'inertie dans le mouvement, ne l'a pas considéré comme naturellement possible, car ce principe suppose toujours l'existence du vide, qui ne se rencontre pas dans la Nature. Ce *φυσικῶς θεωρεῖν* constitue la base de la physique aristotélique. C'est pour cela qu'ARISTOTE n'approuvait pas dans la physique la séparation de l'étude des mathématiques de celle des choses naturelles. Il a introduit dans la philosophie l'étude des petits phénomènes naturels de la vie ordinaire, méprisée par la cosmologie d'origine orientale des philosophes antérieurs. Il attache beaucoup d'importance pour la recherche scientifique aux conceptions de la foule et à l'opinion publique, et même aux caractères des choses, tels que les révèlent leurs noms populaires. Con-

trairement à l'opinion courante, ARISTOTE était un partisan fidèle de l'observation, ayant soin de ne pas dépasser, autant qu'il était alors possible, les limites de la réalité et d'éviter la subordination des faits aux idées a priori. Le style des écrits aristotéliques a la vivacité de la langue parlée — ce qui prouve qu'ils ne sont que les notes de ses cours : c'est sans doute à cause de cela que la critique moderne n'y retrouve plus l'élégance dont parlaient les anciens. M. S.

IIIrd Century B.C. (second half)

(Apollonios). Die Kegelschnitte des APOLLONIOS. Uebersetzt von ARTHUR CZWALINA. IV + 220 S. München, R. OLDENBOURG, 1926. (Kart., 10 Mk.) ISIS

Eine APOLLONIOS-Uebersetzung gibt es im Deutschen eigentlich noch nicht, da die Ausgabe von H. BALSAM (Berlin, 1861) nur eine « Bearbeitung » ist. Es ist daher zu begrüssen, das der ARCHIMEDES-Uebersetzer CZWALINA (die Uebersetzung erschien in *Ostwalds Klassikern*; *Isis*, 5, 186; 6, 139) nun auch den APOLLONIOS aufs Korn genommen hat. Leider haben die Uebersetzungen CZWALINAS alle den Mangel, dass nichts gesagt wird, weder über den Autor und seine Zeit (bei ARCHIMEDES durch ein eigenes Büchlein in der Math.-phys. Bibl. einigermassen wettgemacht; *Isis*, 8, 734), noch über die bisherigen Uebersetzungen, noch über seine eigene Art der Uebertragung (er benützt z. B. moderne Bezeichnungen, was man dem Leser doch mindestens sagen muss). Dass er nur die ersten 4 (griechisch erhaltenen) Bücher wiedergibt, sagt er im Vorwort, nicht aber, wieviel es waren, was mit den anderen ist, usw. In allen diesen Dingen sind die englischen Ausgaben von T. L. HEATH vorbildlich, und auch der neue Uebersetzer ins Französische, P. VER EECKE, hat sich in dieser Hinsicht grosse Mühe gegeben. CZWALINA gibt nur einige sachliche Anmerkungen. H. W.

Rufini, Enrico (Rocca di Papa, 1890, 11, 26 — Roma, 1924, 11, 03). Il Metodo di ARCHIMEDE e le origini dell'analisi infinitesimale nell' antichità. VIII + 294 p., ALBERTO STOCK, Roma, 1926. ISIS

La littérature italienne possédait déjà une traduction de la « Méthode » d'ARCHIMÈDE, publiée par E. GRADARA, in *Rassegna di Mat. e fis.*, en 1923-4. ENRICO RUFINI en avait préparé une nouvelle, en notations modernes. Cette traduction et sa brève préface (pp. 91-187) est encadrée de deux Études de RUFINI qui constituent d'intéressantes contributions à l'histoire des mathématiques, comme on pouvait s'y attendre de ce jeune savant qui se spécialisait dans l'histoire des mathématiques dans l'antiquité. — On trouvera sur RUFINI, in *Arch. di storia d. scienza*, 5, 332-4, 1924 une notice avec bibliographie et portrait. — La première monographie est consacrée à l'origine et au développement de l'analyse infinitésimale jusqu'à ARCHIMÈDE ; voici les titres de ces chapitres : 1. La geometria pitagorica; 2. La critica di PARMENIDE D'ELEA; 3. La polemica di ZENONE D'ELEA; 4. Le ricerche infinitesimale di DEMOCRITO D'ABDERA; 5. Le quadrature del circolo di ANTIFONTE e di BRISONE; 6. EUDOSSO DA CNIDO e la sistemazione critica delle ricerche infinitesimale; 7. Le demostrazioni « per esaustione » di EUDOSSO; 8. Osservazzioni sul metodo di esaustione; 9. Infinito ed infinitesimo secondo ARISTOTELE; 10. Il libro XII degli Elementi d'EUCLIDE; 11. Gli studi d'ARCHIMEDE; 12. Il metodo meccanico d'ARCHIMEDE (pp. 1-88). L'autre monographie qui ferme le livre (pp. 189-284) est consacrée aux intégrations d'ARCHIMÈDE. Le livre est présenté par FEDERIGO ENRIQUES. L. G.

Schoy, C. Graeco-Arabische Studien nach mathematischen Handschriften der Vizeköniglichen Bibliothek zu Kairo, als Festgruss zum 70. Geburtstag der Herrn Prof. J. L. HEIBERG, Kopenhagen, dargestellt. 12 Fig. *Isis*, 8, 21-40, 1926. ISIS

Contains the Arabic version by THÂBIT IBN QURRA of a lost treatise of ARCHIMEDES on the regular heptagon. G. S.

IInd Century B. C. (first half).

Holleaux, Maurice. POLYBE et le tremblement de terre de Rhodes. *Revue des Etudes grecques*, 36, 480-498, 1923. ISIS

Ist Century B. C. (first half)

Diels, H. LUKREZstudien. IV, V. *Sitzungsberichte der Preussischen Akademie, Philol. Kl.*, 1921, 237-244 ; 1922, 46-59. ISIS

Ist Century (first half)

Couchoud, P. L. Le mystère de JÉSUS. 188 p. Paris, F. RIEDER, 1924. ISIS

Reviewed by L. GUINET, *Isis* VIII, 167, 1926.

Garrison, Fielding H. New views of MAX WELLMANN on the authorship of CELSUS. *Annals of Medical History*, 8, 203-207, 1926. ISIS

Largely a translation of WELLMANN's paper in *Arch. f. Gesch. d. Med.*, 16, 209-13, 1925.

Goguel, Maurice. JÉSUS DE NAZARETH, mythe ou histoire. 314 p. Paris, PAYOT, 1925. ISIS

Reviewed by L. GUINET, *Isis*, 8, 167, 1926. See also *Isis*, 9, 149.

Grandmaison, L. de. JÉSUS dans l'histoire et dans le mystère. VIII+80 p. Paris, BLOUD et GAY, 1925. ISIS

Reviewed by L. GUINET in *Isis*, 8, 167, 1926.

Ninck, Johannes. JESUS als Charakter. 3. verbesserte Auflage. VI+315 S. Leipzig, HINRICHS, 1925. ISIS

Reviewed by HERBERT PREISKER, *Deutsche Literaturzeitung*, 1781-82, 1926.

Ist Century (second half)

Delafosse, Henri. Les écrits de SAINT PAUL : I. L'épitre aux Romains ; traduction nouvelle, avec introduction, notes et commentaires ; 160 p. II. La première épitre aux Corinthiens. 184 p. F. RIEDER et Cie, Paris, 1926. ISIS

L'auteur distingue dans la lettre aux Romains au moins quatre rédactions : la lettre de PAUL, écrite en 56, alors qu'il demeurait à Corinthe et qu'il n'avait jamais vu les Romains; les additions qu'y firent vers 140 les marionites, et qui en changèrent complètement la nature; de nouvelles additions faites quelques années plus tard, après la condamnation des marionites; enfin les dissertations et l'apport montaniste appartiennent à une ou

deux rédactions postérieures, mais aussi du deuxième siècle. — La première épitre aux Corinthiens a eu le même sort. — Mais ce qui importe dans cette édition, ce sont les longues introductions (plus de 100 pp. pour chacune d'elles) qui précèdent la traduction : sans commentaires, les écrits de PAUL sont si rugueux qu'ils en sont à peu près illisibles ; l'introduction commente, explique, en cherchant, par des arguments historiques, à rendre à PAUL ce qui est à PAUL. La traduction est donnée sans aucune note, mais avec une disposition typographique qui attribue à chacune des quatre rédactions ce qui lui appartient (l'apport montaniste est ici considéré dans son ensemble.) L. G.

Koller, Wolfgang. Beitrag zur Geschichte der Tierheilkunde unter besonderer Berücksichtigung der Chirurgie und der Augenheilkunde nach dem Werke des römischen Schrifstellers LUCIUS MODERATUS COLUMELLA « De re rustica ». (*Diss.*) München, 1925. ISIS

Petry, Kurt. Zahntherapie in den Werken des Pedanios DIOSKURIDES. *Inaugural-Dissertation* zur Erlangung der zahnärztlichen Doktorwürde der medizinischen Fakultät der Universität Leipzig. 20 S. Berlin, OTTO ELSNER, 1920. ISIS

(Plutarch) Isis et Osiris. Traduction nouvelle de MARIO MEUNIER, avec avant-propos, prolégomènes et notes. 238 p. Paris, L'Artisan du livre, 1924. ISIS

Reviewed by RAYMOND PETIT, *Isis*, 8, 165-167, 1926.

(Quintilian). M. FABII QUINTILIANI Institutionis Oratoriae Liber I. Edited with introduction and commentary by F. H. COLSON. XCVIII+208 S. Cambridge, University Press, 1924. ISIS

Reviewed by W. KROLL, *Deutsche Literaturzeitung*, 1746-48, 1926.

Ropes, James Hardy. The text of the Acts. (The beginnings of Christianity. Part I. The acts of the Apostles. Edited by F. J. FOAKES-JACKSON and KIRSOPP LAKE, vol. 3). London, MACMILLAN, 1926. ISIS

Würschmidt, Jos. Die Schrift des MENELAUS über die Bestimmung der Zusammensetzung von Legierungen. *Philologus*, 80, 377-409, 1925. ISIS

IInd Century (first half)

Chapot, Victor. ARRIEN et le périple du Pont-Euxin. *Revue des Etudes grecques*, 34, 129-154, 1921. ISIS

Lehmann-Hartleben, Karl. Die Trajanssäule. Ein römisches Kunstwerk zu Beginn der Spätantike. 2 Bde. 73 Lichtdrucktaf. nach Photogr. v. C. FARAGLIA u. 28 Textabb. Berlin, Leipzig, WALTER DE GRUYTER, 1926. ISIS

Reviewed by J. SIEVEKING, *Deutsche Literaturzeitung*, 1291-1296, 1926.

Mehlis, Christian. CLAUDIUS PTOLEMAEUS über Altdeutschland. *Γερμανία μεγάλη*. Sonderabdruck aus der *Philologischen Wochenschrift*, 1926, mit der Germania Karte aus dem Codex Urbinas 82 der Vatikanischen Bibliothek zu Rom, 1926. ISIS

Vogt, Heinrich. Griechische Kalender, herausgegeben von F. BOLL. V. Der Kalender des CLAUDIUS PTOLEMAEUS. *Sitzungsberichte der Heidelberger Akademie, Philos. Kl.*, p. 5-61, 1920. ISIS

IInd Century (second half)

(Aurelius Antoninus, Marcus). A moi-même. Manuel de vie stoïcienne écrit par l'empereur MARC AURÈLE ANTONIN pour lui-même. XXXIV+327 p. Paris, Presses Universitaires de France, 1926. ISIS

Cette nouvelle traduction de MARC AURÈLE est fort intéressante parce qu'elle n'est point faite dans l'ordre habituel. L'auteur, GUSTAVE LOISEL, directeur d'études à la Sorbonne, nous raconte dans sa préface qu'il fit campagne avec les Serbes en 1915 et qu'il fut cantonné sur les bords du Danube, dans les lieux mêmes où les grand empereur avait combattu et non loin du lieu où il était mort. Il avait les Pensées avec lui et les étudia avec passion. Il eut enfin une sorte de révélation qui lui permit de redécouvrir l'ordre véritable de ce livre immortel. C'est cet ordre réconstitué par lui qui est suivi dans la traduction. D'après lui, MARC AURÈLE avait voulu écrire un véritable manuel de la vie stoicienne, divisé en trois parties: I. Principes, II. Pratique, III. Perfectionnement, — et douze chapitres. Si cette reconstruction n'avait d'autre résultat que d'attirer l'attention d'un nouveau groupe de lecteurs sur l'un des plus nobles livres de la littérature universelle, il faudrait déjà en être reconnaissant à l'auteur. Au milieu de l'anarchie morale actuelle, l'étude du stoïcisme est l'un des meilleurs remèdes, surtout pour les âmes de plus en plus nombreuses qui ne sont plus soutenues par une discipline religieuse. Je dois avouer cependant que je préfère l'ordre des Pensées, ou si l'on veut le désordre, auquel je suis accoutumé depuis tant d'années. G. S.

Kraft, Benedikt. Die Evangelienzitate des heiligen IRENÄUS nach Ueberlieferung und Textart untersucht. (*Biblische Studien*, XXI, 4). XVI+116 S. Freiburg i. B., HERDER, 1924. ISIS

Reviewed by MAX RAUER, *Deutsche Literaturzeitung*, 1734-1736, 1926.

Malloch, Archibald. GALEN. *Annals of Medical History*, 8, 61-68, 1926. ISIS

Meyerhof, Max. New light on ḤUNAIN IBN ISḤÂQ and his period. *Isis*, 8, 685-724, 1926. ISIS

A very important contribution to the study of Galenic tradition. ḤUNAIN knew of 139 Galenic works, which are here enumerated. See chiefly the last chapter. See also note below under Century IX (2). G. S.

Schoene, Hermann. Verbesserungen zum Galentext. *Sitzungsberichte der Preussischen Akad., Philol. Kl.*, 94-106, 1924. ISIS

Walsh, Joseph. GALEN's discovery and promulgation of the function of the recurrent laryngeal nerve. *Annals of Medical History*, 8, 176-184, 7 illustrations, 1926. ISIS

Wenkebach, Ernst. Untersuchungen über GALENS Kommentare zu den Epidemien des HIPPOKRATES. *Abhd. der Preussischen Akademie der Wissenschaften, Philos. Kl.*, 1925, 1, 53 S. Berlin, 1925. ISIS

IIIrd Century (first half)

Scott, Walter. Hermetica : the ancient Greek and Latin writings which contain religious or philosophic teachings ascribed to HERMES TRISMEGISTUS. Edited with English translation and notes. Vol. I. Introduction. Texts and translation, 549 p. Vol. II. Notes on the Corpus Hermeticum, 482 p. Oxford, Clarendon Press, 1924-1925, ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 343-346, 1926.

Scott, Walter. Hermetica. Vol. III. Notes on the Latin Asclepius and the Hermetic excerpts of STOBAEUS. 632 p. Oxford, Clarendon Press, 1926. ISIS

See review of vol. I and II in *Isis*, 8, 343-346.

IIIrd Century (second half)

Bosmans, Henri (S. J.) DIOPHANTE D'ALEXANDRIE. A propos de la première traduction française de ses Œuvres que vient de publier M. PAUL VER EECKE. *Revue des Questions scientifiques*, avril 1926, 14 p. ISIS

Jackson, A. V. Williams. The doctrine of metempsychosis in Manichaeism. *Journal American Oriental Society*, 45, 246-268, 1925. ISIS

The author considers the statements of Mohammedan writers on the subject, those of Christian anti-Manichæan writers (including those of AUGUSTINE, who at one time belonged to the sect), and the allusions in the Manichæan documents themselves. The conclusion is that the doctrine of metempsychosis was a recognized dogma both in Western and Eastern Manichæism. MANI himself made this dogma a special tenet in his teaching by inculcating that retribution through some form of rebirth was in store for less faithful Auditors and for all Sinners, the Elect alone being exempt. MANI may have derived the idea in the first place from Hellenistic concepts current in Mesopotamia before his banishment to India and Central Asia; but his long sojourn in the East (including India, according to tradition) would certainly have fostered the development of ideas on the subject, particularly as Indian ideas were then current in Central Asia

J. S.

IVth Century (first half).

Helm, Rudolf. EUSEBIUS's Chronik und ihre Tabellenform. *Abhd. der Preussischen Akademie, Philos. Kl.*, 1923, 4. 56 S. Berlin, 1924. ISIS

Vetter, Quido. Quelques remarques sur le papyrus mathématique no. 621 de la Michigan Collection. *Classical Philology*, 20, p. 309-312, Chicago, 1925.

IVth Century (second half).

Rome, A. Le troisième livre des commentaires sur l'Almageste par THÉON et HYPATIE. Extrait des *Annales de la Société Scientifique de Bruxelles*, t. 46, 14 p. Paris, Les Presses Universitaires de France, 1926. ISIS

L'abbé ROME vient de faire une découverte importante : le texte grec du livre III du commentaire de THÉON sur l'Almageste. On se rappellera que l'édition princeps de ce commentaire (1 vol. in folio, Bale 1538) est fort incomplète : des treize livres, il manque le livre III, une partie du livre V, la fin de X, XI en entier, et le début de XII. Le livre III est remplacé par une restitution tentée vers 1350 par NICOLAOS CABASILAS. La seconde (et dernière édition) du commentaire fut entreprise par l'abbé HALMA il y a plus d'un siècle. Deux volumes contenant les livres I et II parurent en 1921, et malheureusement cette publication ne fut pas continuée. HALMA avait travaillé sur les MSS. et, chose étrange, il avait lui-même signalé (sans y croire) l'existance du livre III dans un MS. de Florence (Med. 28. 18, X^e^ siècle.) L'abbé ROME a examiné une trentaine de MSS. des commentaires de THÉON et de PAPPUS sur l'Almageste et ce MS. florentin est le seul qui contienne le livre III de THÉON; c'est aussi presque le seul à contenir le livre VI de PAPPUS. L'examen paléographique et une première étude philologique et mathématique ont convaincu l'auteur que ce livre III est très probablement authentique. Son garant est le Med. 28.18 : ce livre est donc attribué à THÉON depuis le VIII^e^ siècle au moins. Le MS. de ce livre III porte la curieuse mention : « Edition revue par ma fille la philosophe HYPATIE ». Espérons que l'abbé ROME nous donnera bientot une édition critique de ce livre III; cet honneur lui revient de plein droit et il est admirablement outillé pour nous la donner. G. S.

Reinach, Salomon. Un homme à projets du Bas-Empire. *Revue archéologique*, 16, 205-265, 1922. ISIS

A propos du De rebus bellicis, œuvre anonyme qui faisait partie du MS. perdu de Spire. L'auteur en donne une nouvelle édition avec une très longue introduction. Ce texte avait été étudié par BERTHELOT (1900). Comparaison intéressante avec LÉONARD DE VINCI. G. S.

Vth Century (first half).

Holl, Karl. AUGUSTINS innere Entwicklung. *Abhdl. der Preussischen Akademie der Wissenschaften, Philos., Kl.*, 1922, 4, 51 S. Berlin, 1923. ISIS

Ilberg, Johannes. Aus einer verlorenen Handschrift der Tardae passiones des CAELIUS AURELIANUS. *Sitzungsberichte der Preussischen Akademie, Philol. Kl.*, 819-829, 1 Taf., 1921. ISIS

Ilberg, Johannes. Ein weiteres Blatt der Lorscher Handschrift des CAELIUS AURELIANUS. *Sitzungsberichte der Preussischen Akademie, Philol. Kl.*, 282-284, 1922. ISIS

Labriolle, Pierre de. Pourquoi SAINT-AUGUSTIN a-t-il rédigé des Confessions? *Bulletin de l'Association Guillaume Budé*, 30-47, Paris, 1926. ISIS

(Nestorius). The bazaar of Heracleides. Newly translated from the Syriac and edited with an introduction, notes and appendices by G. R. DRIVER and LEONARD HODGSON. XXXV+425 p. Oxford, Clarendon Press, 1925. ISIS

Contents : Introduction; 1. History of the Bazaar. 2. The text. 3. Value of the Syriac translation. 4. History of the controversy. 5. The argument of the Bazaar. Text; Appendices; 1. Translation of the Syriac fragments of NESTORIUS. 2. Critical notes. 3. The word *πρόσωπον* 4. The Metaphysic of NESTORIUS. Index.

(Synesios). The letters of SYNESIUS of Cyrene. Translated into English with introduction and notes by AUGUSTINE FITZGERALD. Oxford, University Press, 1926. ISIS

VIth Century (second half).

Wellmann, M. ARISTOTELES De lapidibus. *Sitzungsberichte der Preussischen Akad., Philol. Kl.*, 1924, p. 79-82. ISIS

The Syrian text translated by K. AHRENS under the title Das Buch der Naturgegenstände (Kiel 1892), dates probably from the second half or the end of the VIth century; for the latest author quoted in the text is SERGIOS OF RESAINA. The earliest Muslim to use that text was ḤUNAIN and the Arabic translation used by him was posterior to the foundation of Bagdad in 763. These remarks enable us to determine more exactly the origin of the Muslim lapidary, which was investigated a few years ago by JULIUS RUSKA, Das Steinbuch des ARISTOTELES. Heidelberg 1912 (*Isis*, 1, 266). G. S.

VIIth Century (first half).

Horovitz, Josef. Koranische Untersuchungen. 171 S. (*Studien zur Geschichte und Kultur des islamischen Orients*, Heft. IV. Zwanglose Beihefte zu der Zeitschrift « *Der Islam* » herausgegeben von C. H. BECKER) Berlin, 1926. ISIS

IXth Century (second half).

Farmer, Henry George. Byzantine musical instruments in the ninth century. *Journal of the Royal Asiatic Society*. Part. II, 1925, 5 p. ISIS

Discussion of a citation from IBN KHURDĀDHBEH in the Golden Meadows of AL-MAS'ŪDĪ. IBN KHURDĀDHBEH « had some reputation as an authority on music. He had been instructed in music and belles lettres by the famous ISḤĀQ AL-MAUṢILĪ, and was the author of two books on music — a Kitâb adab al-samâ (« Book of Liberal Education in Music ») and a Kitâb al-lahw wa'l-malâhî (« Book of Diversion and Musical Instruments »). « The passage certainly bears out this point, that the Byzantines still followed the « ancients » (PLATO, Repub. 399c) in using the term *ὄργανον* for « an instrument of many strings » as well as for « a mechanical wind-fed instrument. » G. S.

Meyerhof, Max. New light on ḤUNAIN IBN ISḤÂQ and his period. *Isis*, 8, 685-724, 1926. ISIS

Elaborate analysis of a most important letter from ḤUNAIN to 'ALÎ IBN YAḤYÂ on all the books of GALEN which, as far as he (Ḥunain) knows, have been translated and on some of them which have not been translated.» The Arabic text of that risâla has been recently edited by GOTTHELF BERGSTRAESSER (Leipzig 1925). MEYERHOF's study is divided as follows: 1. Additions to the biography of ḤUNAIN; 2. ḤUNAIN on the Galenic translations; 3. The translators; 4. The patrons and friends of the translators; 5. GALEN's works and the Alexandrian school. G. S.

Schirmer, Oskar. Ungleichförmige Bewegung eines Gestirns auf dem Tierkreis nach THÂBIT BEN QURRA (826-901). *Sitzungsberichte der Physikalisch-medizinischen Sozietät zu Erlangen*, 58, S. 33-43, 1926. ISIS

XIth Century (first half).

Calverley, E. E. Worship in Islam. 241 pages with bibliography and index. Madras, Christ. Lit., 1925. ISIS

Translation of a part of the Iḥyâ of AL-GHAZZÂLÎ by a pupil of D. B. MACDONALD. G. S.

Kohl, Karl. Über das Licht des Mondes. Eine Untersuchung von IBN AL HAITHAM. *Sitzungsberichte der Physikalisch-Medizinischen Sozietät in Erlangen*, 56, 305-398, 1924-25. ISIS

German translation of an important astrophysical treatise of IBN AL HAITHAM on moonlight (India Office, no. 734, IX, Loth), with an introduction explaining the significance of that treatise and its relation to other works of the same scientist and of others. The treatise (p. 316-398) is divided as follows: 1. Einleitende Betrachtungen. 2. Mondphasen und Mondfinsternisse. 3. Untersuchung der Mondstrahlung. 4. Die Art der Mondstrahlung. 5. Die Ablenkung der Lichtstrahlen an der konkaven Grenzfläche der Sphäre. 6. Der Mond als Selbstleuchter. I quote the final conclusion as summarized by the translator «Zum Schlusse fasst IBN AL HAITHAM noch seine ganze Untersuchung dahin zusammen, dass das Licht des Mondes nicht durch die Reflexion bedingt ist, sondern dadurch, dass die Sonne, solange sie auf den Mond scheint, ihm die Eigenschaft der Selbstleuchter verleiht, d. h. nach moderner Terminologie, dass er das Sonnenlicht diffus reflektiert; ein Begriff, der ihm somit seinem wesentlichen Inhalt nach bereits bewusst geworden ist.» This is an important addition to our knowledge of the great Egyptian physicist, one of the greatest physicists of medieval times. G. S.

Schoy, Carl. AL-BÎRÛNÎ's computation of the value of π. *American Mathematical Monthly*, 33, 323-325, 1926. ISIS

XIth Century (second half).

(Nâṣir-i-Khosraw). Wajh-i-Dîn. 304 p. Berlin, KAVIANI, 1924-1925. ISIS

(Nâṣir-i-Khosraw). Zad al-Mosaferin. XIX+520 p. Berlin, KAVIANI, 1925. ISIS

Reviewed in *Revue du Monde Musulman*, 62, 217-220, 1926.

(Psellos, Michael). Chronographie ou histoire d'un siècle de Byzance (976-1077). Texte établi et traduit par EMILE RENAULD. (Collection Byzantine). Paris, Les Belles Lettres, 1926. ISIS

Rosen, Fr. Ein wissenschaftlicher Aufsatz 'UMAR-I-KHAYYÂMS. *Zeit. d. deutsch. Morgenl. Ges.*, N. F., IV, 133-135, 1925. ISIS

Relatively little of 'UMAR's scientific writings has been preserved. In Cod. Gothanus Arab. 1158 is preserved a short essay, probably a fragment of a larger work, which treats of the determination of the quantities of gold and silver in an alloy of these two metals. The investigation seems to be an application of the discovery of ARCHIMEDES, — another indication that 'UMAR endeavoured to carry on and develop further the science of the Greeks. A translation of the fragment (1 1/2 p.) is given. J. S.

XIIth Century (first half).

Wilensky, M. ABRAHAM IBN EZRA's books Sefer ha-yesod and Sefat yether. *Kirjath Sepher*, Third Year, 73-79, Jerusalem, 1926 (in Hebrew). ISIS

XIIth Century (second half).

Dickinson, John. The mediaeval conception of kingship and some of its limitations, as developed in the Policratus of JOHN OF SALISBURY. *Speculum*, I, 308-337, 1926. ISIS

« The Policratus of JOHN OF SALISBURY is the earliest elaborate mediæval treatise on politics. Completed in 1159, the date of its composition makes it a landmark in the history of political speculation for two reasons. It is the only important political treatise written before western thought had once more become familiar with the Politics of ARISTOTLE. It thus represents the purely mediæval tradition unaffected by ideas newly borrowed from classical antiquity. It is the culmination, in their maturest form, of a body of doctrines which had developed in unbroken sequence from patristic literature in contact with the institutions of the earlier Middle Ages. In the second place, it comes just before the important turning-point in institutional development at the end of the twelfth and at the beginning of the thirteenth century, when legal precision began to be stamped on a great number of previously indefinite relationships, and when feudal independence tended to become consolidated into definite organs of political control. »

Hutton, William Holden. THOMAS BECKET, Archbishop of Canterbury. XII+316 p. 4 plates and a plan. Cambridge, University Press, 1926. ISIS

Revised edition. First published in 1910.

XIIIth Century.

Fischer, Hermann. Mittelhochdeutsche Receptare aus bayerischen Klöstern und ihre Heilpflanzen. *Mitteilungen der Bayer. Botan. Gesellsch.*, München, IV, 69-75, 1926. ISIS

Kraenner, Paul. Falkenheilkunde. (*Dissert.*) 76 S. Berlin, 1925 (*not seen*). ISIS

XIIIth Century (first half).

Hampe, Karl. Zur Gründungsgeschichte der Universität Neapel (*Mitteilungen aus der Capuaner Briefsammlung* V). *Sitzungsberichte der Heidelberger Akademie, Philos. Kl.*, 1923, 10, 9 p. ISIS

Hartmann, Richard. Eine islamische Apokalypse aus der Kreuzzugszeit. Ein Beitrag zur Gafr-Literatur. (*Schrift. d. Königsbergen Gelehrten Gesellschaft.* 1. Jahr. *Geisteswiss. Kl.*) 89-166 S. Berlin, Deutsches Verlagsges. f. Politik und Geschichte, 1924. ISIS

Reviewed by JOSEF HOROVITZ, *Deutsche Literaturzeitung*, 1543-1545, 1926. Based upon a text of MUḤYÎ-AL-DÎN IBN AL-'ARABÎ, who died in 1240. It contains prophecies relative to the years 1166-1186.

XIIIth Century (second half).

Grabmann, Martin. Neu aufgefundene Werke des SIGER VON BRABANT und BOETIUS VON DACIEN. *Sitzungsberichte der Bayerischen Akademie, Philos. Kl.*, 1924, 2, 48 S. ISIS

Holmyard, E. J. ABU-L-QÂSIM AL-'IRÂQÎ. *Isis*, 8, 403-426, 1926. ISIS

Study completing the information already given by HOLMYARD in his edition of the Kitâb al-'ilm al-muktasab (1923; *Isis* VII, 124-128; VIII, 742). Analysis of the MSS. of other works by the same author : Al-aqâlîm al-sab'a (the book of the seven climes); 'Uyûn al-ḥaqâ'iq (the essentials of truth); Al-kanz al-afkhar (the most glorious treasure) which includes a long list of « Decknamen » here translated (cfr. RUSKA and WIEDEMANN, 1924, *Isis*, 8, 794), also a list of chemical apparatus. Medieval Latin versions of passages which occur in the Muktasab. G. S.

Lull, Ramón. Blanquerna : a thirteenth-century romance. Translated from the Catalan by E. ALLISON PEERS. London, JARROLDS, 1926. ISIS

Polo, Marco. Am Hofe des Grosskhans. Reisen in Hochasien und China, bearbeitet von DR. ALBERT HERRMANN. (*Alte Reisen und Abenteuer*, 11). 158 p., illustrations, maps, plans, plates. Leipzig, BROCKHAUS, 1924. ISIS

German translation of passages from MARCO POLO, with introduction by the editor. J. K. W.

XIVth Century (first half).

Tatham, Edward Henry Ralph. FRANCESCO PETRARCA. Volume II. London, Sheldon Press, 1926. ISIS

For vol. I see *Isis*, 8, 747; *Deutsche Literaturzeitung*, 1689-1695, 1926.

Thorndike, Lynn. Another treatise by BARNABAS DE RIATINIS of Reggio. *Isis*, 8, 285-286, 1926. ISIS

Apropos of the De naturis et qualitatibus alimentorum, completed by BARNABAS at Venice in November 1338. Brief analysis. G. S.

Thorndike, Lynn. Relations of the Inquisition to PETER OF ABANO and CECCO D'ASCOLI. *Speculum*, I, 338-343, 1926. ISIS

XIVth Century (second half).

(Ibn Hudhail, 'Alî ibn 'Abd al-Raḥman al-Andalusî, fl. c. 1356). La parure des cavaliers et l'insigne des preux. Edité d'après le Ms. de M. NEHLIL, revu et corrigé sur l'exemplaire de la bibliothèque de l'Escurial, par LOUIS MERCIER, Consul de France. IV+98 p., 1922. Traduction française précédée d'une étude sur les sources des hippiatres arabes et accompagnée d'appendices critiques sur l'histoire du pur-sang, de l'équitation et des sports hippiques arabes, en Maghreb et en Orient. Avec 23 photographies et 11 dessins. Par LOUIS MERCIER. XVI+583 p. 1924. Paris, PAUL GEUTHNER, 1922-1924. ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 346-349, 1926.

I have received a long letter from Mr. LOUIS MERCIER, too long to be reproduced, the upshot of which is that in his opinion, this work is more likely to be a mukhtaṣar (abridgment) by the original author than a plagiarism as I suggested. I was wrong in saying that he had given no information on the MSS.; on the contrary he reproduced in Spanish CASIRI's analysis of the Escorial MS., and translated the final sentences of Mr. NEHLIL's MS. wherein that copy is dated 1698. I understand that he will soon publish the first part of IBN HUDHAIL's work; this will enable him to set the whole matter right. G. S.

Mazzini, Giuseppe. Vita e opera di maestro PIETRO DA TOSSIGNANO, con prefazione di GUGLIELMO BILANCIONI. (La medicina in Italia nel secolo XIV). (*Studi di storia del pensiero scientifico diretti da* ALDO MIELI, 6). XXI+160 p. 20 ill. Roma, Leonardo da Vinci, 1926. ISIS

According to various historians (F. PUCCINOTTI, HENSCHEL, S. DE RENZI, K. SUDHOFF, etc.) there was more than one author called PIETRO DA TOSSIGNANO; there were two or three. MAZZINI, who seems to have made an exhaustive study of all available documents, refutes that theory. PIETRO was a scion of the old CURIALTI family; he must have been born in the first half of the XIVth century, for he was already a medical instructor in Bologna in 1364; he died in Bologna, on April 8, 1407. After a very elaborate discussion of all the biographical facts, MAZZINI proceeds to examine TOSSIGNANO's works: 1. Consilium pro peste evitanda included in KETHAM's Fasciculus medicinæ; 2. De regimine sanitatis (Paris 1536); 3. Receptæ super nonum ALMANSORIS (Venice 1517); 4. Liber de balneis BURMI (in De Balneis, Juntas, Venice 1553); 5. Tabula super problemata ARISTOTELIS, (Venice 1501.). The bibliographical appendix contains abundant information not only on the early printed editions, but also on many MSS. copies. This monograph is a valuable addition to our knowledge of XIVth century medicine; it is well printed and illustrated, but the lack of an index is deplorable. G. S.

Thompson, Daniel Varney, jr. Liber de coloribus illuminatorum siue pictorum from Sloane MS. no. 1754. *Speculum*, I, 280-307, 1926. ISIS

« The script of the book is pretty surely French. It is written in a good clear hand, with no German characteristics, and obviously dates from the fourteenth century..... It is, therefore, one of the latest of the purely mediæval treatises dealing with the technical art of illumination. It stands in a long line of such manuscripts, beginning, in the Middle Ages, with the *Compositiones ad tingenda nusiua, pelles et alia* &c. and continuing through such diverse works as the *Schedula Diuersarum Artium* of THEOPHILUS (RUGERUS), the *Mappæ Clauicula*, the *de Coloribus et Artibus Romanorum* of HERACLIUS, and many others of later date..... The author, or rather the editor of the *Liber de Coloribus* has drawn in some way upon no less than four earlier writers, and perhaps more, for his material. Much of this borrowing undoubtedly took place through intermediate sources which are lost to us; but, however broken the descent, this tract presents to us, in recognizable form, about the year 1400, passages descended from the third book of HERACLIUS, from the twelfth-century additions to the *Mappæ Clauicula*, from the early thirteenth-century *Addenda* in the Harleian manuscript of THEOPHILUS, themselves almost wholly derived from the *Mappæ Clauicula*, and from the treatise of PIERRE DE ST. OMER. » Latin text with English translation. G. S.

XVth Century (first half).

Borren, Charles van den. GUILLAUME DUFAY (m. 1474). Son importance dans l'évolution de la musique au 15e siècle. Bruxelles, M. HAYEZ, 1926. ISIS

Feis, Oswald. Arzt und Astrologe. Lesefrucht. *Archiv für Gesch. der Medizin*, 18, 269-270, 1926. ISIS

Apropos of AMERBACH (JOH. REYER), town physician in Frankfurt a. M, 1432-1435.

Klinckowstroem, Carl von. GIOVANNI DE FONTANA, fl. c. 1420 (Answer 3). *Isis*, 8, 338, 1926. ISIS

Lochmann, Werner. Zahnheilkundiges bei GIOVANNI MICAELE SAVONAROLA. *Inaugural-Dissertation* zur Erlangung der Doktorwürde in der Zahnheilkunde einer hohen medizinischen Fakultät der Universität Leipzig. 30 p. Leipzig, ALEXANDER EDELMANN, 1926. ISIS

Longhena, Maio. I manoscritti del IV libro del De Varietate Fortunae di POGGIO BRACCIOLINI contenanti il racconto dei viaggi di NICOLÒ DE' CONTI. *Bollettino della Reale Società Geografica Italiana*, ser. VI, 2, 191-215, 1925. ISIS

The fifteenth century humanist POGGIO BRACCIOLINI has preserved to us the narrative of the great voyage of NICOLÒ DE' CONTI to India and the Far East in the early fifteenth century. This study of the manuscripts forms part of a larger program of research leading toward the establishment of a critical text of CONTI's voyage. J. K. W.

Thorndike, Lynn. The manuscript text of the Cyrurgia of LEONARD OF BERTIPAGLIA. *Isis*, 8, 264-284, 1926. ISIS

« Numerous important differences exist between the text of the work on surgery of LEONARD OF BERTIPAGLIA, as given in such printed editions of it as I have been able to see, and the text as presented in two fifteenth century manuscripts.... LEONARD OF BERTIPAGLIA is an interesting representative of the relations between medicine and surgery in the fifteenth century, and this is brought out especially by the very passages that have been omitted in the printed editions..... He was on good terms and a footing of equality, it would seem, with his medical colleagues of the highest reputation at Padua. He appears at one time to have traveled as far as Alexandria in Egypt, if not to forbidden Mecca itself. A new edition of his text, based on the manuscripts, of which others can probably be found than the two that I have used, would seem to be highly desirable. »

Appendices. I. The two different prologues of the manuscripts and editions. II. Table of contents from Sloane MS. 3863, fols. 109r-110r. III. LEONARD's surgical practice with the family of GAZABINUS.

XVth Century (second half).

Baas, Karl. Die beiden Aerzte JOHANN WIDMANN. Ein Nachtrag. *Zeitschrift f. d. Gesch. des Oberrheins*. Bd. 39, H. 3, 1925. ISIS

J. W. of Möchingen, best known of both, and J. W. of Heinsheim.

Dialogus creaturarum. Die Zwiesprach der Tiere. Das erste Tierbuch. 75 S. 38 Holzschnitte mit dazugehörigen Text. (Gouda, 1480). München, Verlag der Münchner Drucke, 1926. ISIS

Le grant Kalendrier et compost des Bergiers avecq leur Astrologie et plusieurs aultres choses. Imprimé nouvellement pour PAYOT, Libraire à Paris, 110 p., 1925. ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 354-355, 1926.

(Ketham, Joannes de). The fasciculo di medicina, Venice, 1493. With an introduction, etc. by CHARLES SINGER. 2 vol. folio. Part I, 112 p. atlas of 90 illustrative figures from manuscript and printed sources with explanatory legends ; Part II. Facsimile, 104 p. (*Monumenta medica* under the general editorship of HENRY E. SIGERIST, volume II.) Florence, R. LIER, 1925. ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 350, 1926.

Klebs, Arnold C. Hortus sanitatis. *Times Literary Supplement*, August 5, 1926, p. 525. ISIS

Marzell, Heinrich. Einige Bemerkungen zu den Pflanzennamen im Herbarius des VITUS AUSLASSER von Ebersberg (1479). *Mitt. d. Bayer. Bot. Gesch.*, 4, 75-78, 1926. ISIS

See *Isis*, 7, 540; 9, 154, under H. FISCHER.

Molitor, Ulric. Des sorcières et des devineresses. Reproduction en facsimile d'après l'édition latine de Cologne, 1489, et traduction

pour la première fois en Français. LXIV+84 p. EMILE NOURRY, Paris, 1926. ISIS

On sait fort peu de choses sur la vie de l'auteur de ce traité des sorcières et des devineresses. Il est né à Constance; on le trouve étudiant à Pavie; il revient à Constance où il est docteur ès lois de la cour et défenseur devant le tribunal de l'archiduc SIGISMOND D'AUTRICHE, en honneur de qui le livre est écrit; il meurt en 1492. Le traité des sorcières a été édité à Cologne, sans date, mais avec une épitre dédicatoire de 1485. L'édition ici parfaitement reproduite — c'est la première fois à ma connaissance, qu'un facsimile d'incunable est donné avec le rouge des rubriques — est celle de 1489. — L'auteur, très crédule, est évidemment peu propre à éclairer SIGISMOND sur la réalité des sortilèges, des enchantements, mais son ouvrage, établi en forme de dialogue entre SIGISMOND, MOLITOR, et un troisième personnage, CONRAD STURCZEL, est cependant un document précieux parce qu'il nous fournit des renseignements de première main sur les croyances relatives à la sorcellerie vers la fin du XV^e^ S.; nous y voyons qu'il y avait alors des hommes, tel SIGISMOND D'AUTRICHE, qui manifestaient des doutes non seulement sur l'excellence de la procédure usitée par les tribunaux contre les sorcières, mais aussi sur la réalité des pouvoirs que leur attribuaient l'opinion publique, la tradition, dont MOLITOR, encore qu'il fasse la part des hallucinations, se fait le défenseur. — Ce petit traité contient sept bois gravés dont six représentent des scènes de sorcellerie. L. G.

Plischke, Hans (*ed.*) CHRISTOPH KOLUMBUS. Die Entdeckung Amerikas, nach zeitgenössischen Quellen bearbeitet. (*Alte Reisen und Abenteuer*, 5). 158 p., plates, maps. Leipzig, BROCKHAUS, 1923. ISIS

German translations preceded by a brief, popular, biographical sketch of COLUMBUS, of the admiral's diary of the first voyage as abridged by BARTOLOME DE LAS CASAS, of certain of his letters relating to the third and fourth voyages, and of Dr. CHANCA's account of the second voyage sent to the Cathedral Chapter at Seville. J. K. W.

Plischke, Hans (*ed.*) VASCO DA GAMA ; der Weg nach Ostindien, nach zeitgenössischen Quellen bearbeitet. (*Alte Reisen und Abenteuer*, 13). 158 p., illustrations, maps, plates, portraits. Leipzig, BROCKHAUS, 1924. ISIS

German tranlations of a diary kept by a sailor on GAMA's voyage (Roteiro da viagem de VASCO DA GAMA en 1497) and of passages from the Leridas da India of GASPAR CORREA (died c. 1560) describing GAMA's role as viceroy of India and his death in 1524. J. K. W.

Roncière, Charles de la. La carte de CHRISTOPHE COLOMB. Text in French and English paged separately with separate title page and table of contents, each part consisting of 42 cols. of text ; 6 fig. in text, 2 plates, 1 large separate photographic facsimile. Paris, EDOUARD CHAMPION, 1924. ISIS

Reviewed by J. K. WRIGHT, *Isis*, 8, 168-173, 1926. Explanatory letter by the author, *Isis*, 8, 726-728, 1926.

(Rüst, Hans, 15th c.) Das ist die mapa mundi und alle land und Kungreich wie sie ligend in der gantze welt. Facsimile in colors ; 40×

28.2 cm. Munich, LUDWIG ROSENTHAL's Antiquariat, no date (1925?). ISIS

The original of this world map is now in the Pierpont Morgan library in New York. It is possibly the oldest known printed (wood-cut) map (about the middle of the fifteenth century). The map is typically medieval, the east with the Garden of Eden being placed at the top. See note in the *Geographical Journal*, 65, p. 469, 1925. J. K. W.

Smith, David Eugene. The first great commercial arithmetic. *Isis*, 8, 41-49, 1926. ISIS

Analysis of the *Nobel opera de arithmetica* (Libro Dabacho) Venice 1484, with brief mention of the many ulterior editions. This may be considered a sequel to the author's analysis of the first printed arithmetic, Treviso 1478 (*Isis*, 6, 311-331). A very useful text for supplementary reading in a course on the history of mathematics. G. S.

Sudhoff, Karl. The earliest printed literature on syphilis, being tractates from the years 1495-1498. In complete facsimile with an introduction and other accessory material, adapted by CHARLES SINGER. (*Monumenta medica*, edited by HENRY E. SIGERIST, 3). Florence, R. LIER, 1925. ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 351-354, 1926.

Thorndike, Lynn. LEONARDUS QUALEA (Answer 2). *Isis*, 8, 336-338 1926. ISIS

QUALEA wrote his Astronomica medicinalis between 1470 and 1475, not c. 1460 as suggested by P. DUHEM. THORNDIKE has reexamined the manuscript of that treatise at the Bibliothèque Nationale, Paris (Latin MS 10264) and gives an analysis of it. G. S.

Wickersheimer, Ernest. La médecine chez les Cisterciens de Maulbronn au XV^e^ siècle. *Janus*, 30, 79-85, 1926. ISIS

Etude du MS. 20 de la Bibliothèque universitaire et régionale de Strasbourg, « recueil de recettes, de travaux de médecine d'étendue inégale, souvent anonymes, généralement en latin, parfois en allemand, qu'un moine de Maulbronn (Würtemberg) commença à former vers le milieu du XV^e^ siècle, et que ses successeurs enrichirent d'additions pendant les quarante ou cinquante années qui suivirent ». Deux de ces travaux, peut-être trois, sont dus à MAITRE BERCHTOLD, moine de Maulbronn, de qui SUDHOFF a déjà publié un régime de pestilence qu'il datait de la première moitié du XV^e^ S. (*Isis*, 3, 327). L'auteur a trouvé dans l'un d'eux quelques renseignements sur ce BERCHTOLD : avant d'être moine, il avait parcouru l'Italie, étudié la chirurgie sans doute à Bologne où il était peut-être encore en 1425, séjourné à Milan, Gènes, Venise. L. G.

Leonardo da Vinci.

Baldacci, Antonio. Le piante di LEONARDO DA VINCI nel Codice della Biblioteca Reale del Castello di Windsor. Parte I. *Memorie della R. Accademia delle scienze dell'Istituto di Bologna*, 7, 6 p., 1922-1923. ISIS

See *Raccolta Vinciana*, 12, p. 6, 1926.

Baratta, Mario. Sopra le fonti cartografiche di LEONARDO DA VINCI. Comunicazione fatta all'VIII Congresso geografico italiano (Firenze, aprile, 1921). 15 p. Firenze, ALINARI, 1923. ISIS

See *Raccolta Vinciana*, 12, p. 7, 1926.

Beltrami, Luca. La figura morale di LEONARDO. *La Stirpe*, Roma, luglio 1924. ISIS

See *Raccolta Vinciana*, 12, p. 19, 1926.

Beltrami, Luca. Miscellanea vinciana. 29 p. Milano, ALLEGRETTI, febraio, 1923. ISIS

I. Divagazioni sul monumento Trivulzio. II. Alla memoria di GUSTAVO UZIELLI. III. Notizie su GIAFFREDO CARLI. See *Raccolta Vinciana*, 12, p. 9-11, 1926.

Beltrami, Luca. Miscellanea vinciana. 34 p. Milano, ALLEGRETTI, luglio 1923. ISIS

I. L'espugnazione del castello di Trezzo nel gennaio 1513 in uno schizzo di LEONARDO. II. FRANCHINO GAFFURIO, il « Musicista » di LEONARDO. III. Il « compare mio maestro BENEDETTO scultore » di LEONARDO DA VINCI e la tomba di AMBROGIO GRIFO. IV. Di un disegno vinciano già nella Raccolta De Pagave, erroneamente considerato come smarrito. V. Ancora per la madre di LEONARDO. See *Raccolta Vinciana*, 12, p. 11-15, 1926.

Caetani, (Don) Gelasio. The myriad-minded LEONARDO DA VINCI, forerunner of modern science. *Scientific Monthly*, vol. 19, 449-464, 1924. ISIS

Popular article by an Italian ambassador to the United States. G. S.

Calvi, Gerolamo. I manoscritti di LEONARDO DA VINCI dal punto di vista cronologico storico e biografico. 321 p., illustrated. (*Pubblicazioni dell'Istituto Vinciano* in Roma, diretto da MARIO CERMENATI, VI). Bologna, ZANICHELLI, 1925. ISIS

See *Raccolta Vinciana*, 12, p. 22-37, 1926.

De Simone, Stefano. Manuale di lettere italiane. Vol. III : Scienziati ed artisti, parte II : LEONARDO DA VINCI, con la vita scritta da GIORGIO VASARI. 166 p. Torino, LATTES, 1925. ISIS

See *Raccolta Vinciana*, 12, p. 51, 1926.

De Toni, G, Battista. GIAMBATTISTA VENTURI e la sua opera vinciana. Scritti inediti e l' « Essai » (Vinciana d'Italia : biografie e scritti. *Pubblicazioni dell'Istituto di studi vinciani* in Roma diretto da MARIO CERMENATI). 273 p. Roma, MAGLIONE e STRINI, 1924. ISIS

See *Raccolta Vinciana*, 12, 52-54, 1926.

Favaro, Giuseppe. LEONARDO e la topografia dorsale dei visceri. *Emporium*, Bergamo, vol. 49, 1919. ISIS

See *Raccolta Vinciana*, 12, p. 55, 1926.

Favaro, Giuseppe. LEONARDO DA VINCI e GIROLAMO FABRICI D'ACQUAPENDENTE nella storia delle scienze biologiche. 9. p. *Bollettino dell'Istituto storico italiano dell'arte sanitaria*, appendice alla *Rassegna di clinica, terapia e scienze affini*, vol. 24, 1925. ISIS

See *Raccolta Vinciana*, 12, p. 60, 1926.

Knapp, F. LEONARDO DA VINCI. IV+104 p., 36 pl. Dresden, REISSNER, 1924. ISIS

See *Raccolta Vinciana*, 12, p. 80-82, 1926.

Lebengarc, J. Die Anatomie und Physiologie des Herzens in LEONARDO DA VINCIS anatomischen Manuskripten. *Archiv für Geschichte der Medizin*, 18, 172-188, 1926. ISIS

Leonardo da Vinci. I manoscritti e i disegni pubblicati dalla Reale Commissione Vinciana sotto gli auspici del Ministero della Istruzione pubblica. Volume I : Codice Arundel 263, Parte I. 184 p., 184 tav., 131 fig. ISIS

See *Raccolta Vinciana*, 12, p. 87-91, 1926.

Marcolongo, Roberto. La prima parte del codice Arundel 263 di LEONARDO DA VINCI. 11 p. *Bollettino dell'Unione matematica italiana*, vol. 4, 1925. ISIS

See *Raccolta Vinciana*, 12, p. 106-107, 1926.

Mesnil, Jacques. La perspective linéaire chez LEONARD DE VINCI. *Revue archéologique*, 16, 55-76, juillet-octobre 1922. ISIS

See *Raccolta Vinciana*, 12, p. 117, 1926.

Ritter, S. BALDASSARE OLTROCCHI (m. 1797) e le sue memorie storiche su la vita di LEONARDO DA VINCI. 125 p. (*Istituto di studi vinciani* in Roma diretto da MARIO CERMENATI. Vinciani d'Italia : biografie e scritti. III). Roma, MAGLIONE e STRINI, 1925. ISIS

See *Raccolta Vinciana*, 12, p. 132-134, 1926.

Valéry, Paul. Introduction à la méthode de LEONARD DE VINCI. 3e édition. 100 p. Paris, Nouvelle Revue française, 1919. ISIS

See *Raccolta Vinciana*, 12, p. 148-150, 1926.

Verga, Ettore. Gli studi intorno a LEONARDO DA VINCI nell'ultimo cinquantennio : 1872-1922. 151 p. (*Pubblicazioni dell'Istituto di studi vinciani* in Roma diretto da MARIO CERMENATI). Roma, MAGLIONE e STRINI, 1924. ISIS

Verga, Ettore. Raccolta Vinciana. Fascicolo XII, 1922-25. XX+206 p. Archivio storico civico, Milano, Castello Sforzesco, 1926. ISIS

VERGA's contributions to the study, and especially to the bibliography, of LEONARDO have often been mentionned in *Isis* (see vol. V, 506; IX, 156.)

It will suffice here to announce briefly the publication of the twelfth part of his very valuable Raccolta. It contains as usual reviews of the latest works on the subject (some of them, being very elaborate are quoted in this section) and also some reviews of earlier works which had thus far escaped his attention. A good preface indicates the most significant contributions and thus serves as a guide for the whole volume. The critical part is followed by three original papers contributed by himself under the general title Varietà Vinciane : 1. Pagine inedite del Codice Atlantico; 2. Una visita ai codici vinciani a Parigi nel 1810; 3. La scoperta di una chiusa in Francia attributa a LEONARDO DA VINCI, and by a few shorter notes and obituaries. There is also an excellent index to numbers XI and XII of this collection. G. S.

XVIth Century (whole and first half).

A. — *Mathematics.*

Bortolotti, Ettore. L'algebra nella scuola matematica Bolognese del Secolo XVI. *Periodico di Matematiche*, 5, p. 147-184, 1925. ISIS

Clarke, Frances Marguerite. New light on ROBERT RECORDE. *Isis*, 8, 50-70, 1926. ISIS

Putting together all the facts known about the very interesting personality of ROBERT RECORDE. G. S.

B. — *Physical sciences and technology.*

(Biringuccio). Pirotechnia. Ein Lehrbuch der chemisch-metallurgischen Technologie und des Artilleriewesens aus dem 16. Jahrhundert. Uebersetzt und erläutert von OTTO JOHANNSEN. XVI+544 S., 85 Abb. Braunschweig, VIEWEG & Sohn, 1925. ISIS

Brasch, Frederick E. The English translation of De revolutionibus orbium cœlestium. *Science*, 64, 158, 1926. ISIS

Apropos of the translation in course of preparation by J. F. DOBSON, Professor of Greek at the University of Bristol and S. BRODETSKY, Lecturer in applied mathematics at the University of Leeds, and of various other translations and editions. G. S.

Davis, Tenney L. The autobiography of DENIS ZACHAIRE. 1 pl. *Isis*, 8, 287-299, 1926. ISIS

This account has been published in *Isis* not only because of its human interest but chiefly because it throws a valuable light upon the psychology of XVIth century alchemy. Professors teaching the history of chemistry will find it a very useful text to be referred to as supplementery reading. G. S.

Hellmann, Gustav. Versuch einer Geschichte der Wettervorhersage im XVI. Jahrhundert. *Abhdl. der Preussischen Akademie der Wissenschaften, Physik. Kl.*, 1924, 1, 54 p. Berlin, 1924. ISIS

1. Die Wettervorhersage in den Prognostiken des XVI. Jahrhunderts ; 2. Die Anleitungen zur Wettervorhersage ; 3. Bauernregeln. ISIS

C. — *Natural sciences.*

Almagià, Roberto. La più antica carta stampata del Piemonte. *L'Universo*, anno VI, 985-989, 1 map, 1925. ISIS

Description with reproduction of an undated wood-cut map of Piedmont in the University Library at Leiden. The map was printed by MATTEO PAGANO. From internal evidence ALMAGIÀ believes that it was drawn in 1538 or 1539 to illustrate the theater of the war in Piedmont between 1536 and 1544. J. K. W.

Alvarado, Pedro de. An account of the conquest of Guatemala in 1524 by PEDRO DE ALVARADO. Edited by SEDLEY J. MACKIE, with a facsimile of the Spanish original, 1525. (*Documents and narratives concerning the discovery and conquest of Latin America*, published by the Cortes Society, New York. No. 3), 146 p., map, port. New York, The Cortes Society, 1924. ISIS

(**Diaz del Castillo, Bernal**) HERNANDO CORTES, Die Eroberung von Mexiko ; nach dem Bericht des DIAZ DEL CASTILLO bearbeitet von H. G. BONTE. (*Alte Reisen und Abenteuer*, 9). 158 p., 2 maps, pl. Leipzig, BROCKHAUS, 1924. ISIS

German translation with introduction, of parts of DIAZ DEL CASTILLO's (1492-1581?) Historia verdadera de la conquista de la Nueva España. J. K. W.

(**Fries, Laurens**, early 16th C.) LAURENTIUS FRISIUS, Carta Marina universalis 1530, nach dem einzig bekannten Exemplar in der Bayerischen Staatsbibliothek in München neu herausgegeben von LUDWIG ROSENTHAL's Antiquariat in München (Bayern). n. d. (1925?) ISIS

This facsimile in 12 sheets bound as an atlas is apparently on the same scale as the original. It is unaccompanied by explanatory text of any sort. The original, a large xylograph richly decorated and with abundant legends, shows the world from the east coast of the Americas to the east coast of Asia. The author, a physician and mathematician of Metz, was editor of a Strasbourg edition of PTOLEMY's Geography, 1522. See A. E. NORDENSKIÖLD, Facsimile atlas to the early history of cartography, Stockholm, 1888, pp. 20-22, 101, 103, pl. XXXIX; H. HARRISSE, Bibliotheca americana vetustissima, New York, 1866, p. 246; additions, Paris, 1872, pp. 99-100. J. K. W.

Ispizua, Segundo de. La primera vuelta al mundo. 2 vols. 150 p. Madrid, MATHEU, 1926 (*not seen*). ISIS

Apropos of MAGELLAN's and EL CANO's journey.

Lehmann-Nitsche, R. Los primeros Alemanes en el Rio de la Plata. *Fenix*, Revista de la Sociedad Científica Alemana de Buenos Aires, ano VI, 205-233, 1926. ISIS

Lint, J. G. de. VALERIUS CORDUS and the discovery of ether. *Isis*, 8 163, 1926. ISIS

Note to C. D. LEAKE's article. *Isis*, 7, 14-24, 1925.

(Pizarro, Francisco). Der Sturz des Inkareichs. Nach den Berichten des GARCILASO DE LA VEGA und des Paters JOSÉ DE ACOSTA (S. J.) bearbeitet von H. G. BONTE. (*Alte Reisen und Abenteuer*, 14). 158 p. Many fig. Leipzig, BROCKHAUS, 1925. ISIS

Plischke, Hans, (*ed.*) FERNÃO DE MAGALHÃES. Die erste Weltumseglung, nach zeitgenössischen Quellen bearbeitet. (*Alte Reisen und Abenteuer*, 1). 158 p., pl., maps. Leipzig, BROCKHAUS, 1922. ISIS

After a brief popular introduction, German translations are given from ANTONIO PIGAFETTA's narrative of MAGELLAN's voyage and from MAXIMILIAN VON ZEVENBERGHEN's letter to MATTHIAS LAND (1522) on the Spanish discovery of the Moluccas. J. K. W.

Vasconcellos, Ernesto de. A carta planisferica de ALBERTO CANTINO (c. 1501, 1502). *Boletim da Sociedade de Geografia Lisboa*, ser. 40a, 308-316, 1922. ISIS

Wieser, F. v. Das Welserland auf den Karten des sechzehnten Jahrhunderts. Festschrift EDUARD SELER, dargebracht zum 70. Geburtstag von Freunden, Schülern und Verehrern, herausgegeben von WALTER LEHMANN. p. 645-654, 4 maps. Stuttgart, STRECKER und SCHRÖDER, 1922. ISIS

By the Welserland is meant that part of Venezuela in which the Welsers of Augsburg attempted to establish a colony in 1528. As early as 1529 there occurs a reference to this colony on a Spanish map, that of DIEGO RIBERO; it was also not infrequently shown on later sixteenth century maps. J. K. W.

D. — *Medical sciences.*

(Paracelsus). Sämtliche Werke. Nach der 10 bändigen Huserschen Gesamtausgabe (1589-1591) zum erstenmal in neuzeitliches Deutsch übersetzt. Mit Einleitung, Biographie, Literaturangaben und erklärenden Anmerkungen versehen von BERNHARD ASCHNER. Erster Band. XLVIII+1012 p. Jena, GUSTAV FISCHER, 1926. ISIS

(Paracelsus). THEOPHRASTUS gen. PARACELSUS, medizinische, naturwissenschaftliche und philosophische Schriften, herausgegeben von KARL SUDHOFF, Neunter Band. 706 S. München, O. W. BARTH 1925. ISIS

Reviewed by KARL SUDHOFF, *Mitt. zur Gesch. d. Med.*, 253, 1926. For previous volumes of the same splendid edition, see *Isis*, 6, 56; 8, 756.

Rogers, James Frederick. In an old health-book. *Scientific Monthly*, vol. 20, 73-77, 1925. ISIS

Apropos of the Castell of Helth, 1534, by THOS. ELIOT, and the Haven of Health, 1584 by THOS. COGAN. G. S.

Schadelbauer, Karl. Die Sterzinger Pestordnung vom Jahre 1534. *Archiv für Gesch. der Med.*, 18, 192-196, 1926. ISIS

E. — *Alia.*

Allen, P. S. et H. M. Opus epistolarum Des. ERASMI Roterodami denuo recognitum et auctum. Tom. 6, 1525-1527. Oxonii in Typographeo Clarendoniano, 1926. ISIS

See *Isis*, 5, 508; 7, 210.

Hahn, Ed. Geistige Einwirkungen der Entdeckung Amerikas auf Europa. Festschrift EDUARD SELER, dargebracht zum 70. Geburtstag von Freunden, Schülern und Verehrern, herausgegeben von WALTER LEHMANN. p. 147-155. Stuttgart, STRECKER und SCHRÖDER, 1922. ISIS

The human sacrifices. which formed such an important element in Aztec religion at the time of the conquest of Mexico, were interpreted by European theologians as devil worship and regarded as proof of the existence of similar devil worship on the part of witches in Europe. This mistaken interpretation of the true signifiance of the Mexican religious practices had no little influence in stimulating the 16th and 17th centuries epidemic of witch persecution. J. K. W.

Huguet, Edmond. Dictionnaire de la langue française du XVI^e^ siècle. T. 1, fasc. 1 et 2. Paris, CHAMPION, 1925. ISIS

Salter, Frank Reyner (*editor*). Early tracts on poor relief. London, METHUEN, 1926. ISIS

Tyndale, William. The beginning of the New Testament, translated by him, 1525. Facsimile of the unique fragment of the uncompleted Cologne edition. With an introduction by ALFRED W. POLLARD. Oxford, Clarendon Press, 1926. ISIS

XVIth Century (second half).

A. — *Mathematics.*

Bosmans, Henri (S. J.) ALBERT GIRARD et VIÈTE. A propos de la « syncrèse » de ce dernier. *Annales de la Société scientifique de Bruxelles*, 45, 35-42, 1926. ISIS

Bosmans, Henri (S. J.) Le mathématicien belge SIMON STEVIN de Bruges (1548-1620). *Periodico di Matematiche*, 6, 231-261, luglio 1926. ISIS

B. — *Physical sciences and technology.*

Blomefield, Miles. English alchemist (1525-1574?). (Query 4). *Isis*, 8, 339, 1926. ISIS

Dean, John Candee. The astronomy of SHAKESPEARE. *Scientific Monthly*, 19, 400-406, 1924. ISIS

C. — *Natural sciences.*

Damm, Hans (*ed.*) FRANCIS DRAKE als Freibeuter in Spanisch-Amerika. (*Alte Reisen und Abenteuer*, 10). 158 p., illus. pl., maps. Leipzig, BROCKHAUS, 1924. ISIS

German translation of contemporary documents.

Delaunay, Paul. L'aventureuse existence de PIERRE BELON du Mans. XII+180 p., 11 dessins de PAUL CORDONNIER-DÉTRIÉ. Paris, Ed. CHAMPION, 1926. ISIS

Dans cette monographie, parue d'abord dans la *Revue du XVI^e Siècle* (1922-5), P. DELAUNAY expose la vie de voyageur infatigable que fut celle de son compatriote PIERRE BELON (1517?-1564), pour autant qu'on peut la connaître par sa *Chronique* [inédite, biblioth. de l'Arsenal, Paris, ms. 4651 (904 H. F.)], et le peu qu'il accorde à la précision chronologique dans ses œuvres imprimées, où il est largement question de ses voyages en Grèce, Asie, Judée, Egypte, Arabie. A partir de 1549, BELON mène une vie un peu plus calme : il rédige ses observations sur les oiseaux, sur les plantes, sur les souvenirs archéologiques de son voyage en Egypte; il prend ses grades de médecin à la Faculté de Paris; il se propose d'acclimater en France nombre de plantes qu'il a vues dans ses pérégrinations .— On chercherait en vain dans le travail de DELAUNAY des renseignements sur les vues, si originales pour l'époque, de BELON sur la constitution des poissons, des oiseaux, et qui font de lui, beaucoup plus que ses allées et venues, une figure intéressante de l'histoire de l'anatomie comparée. L. G.

Deventer, Jacques de († 1575). Atlas des villes de la Belgique au XVI^e siècle. Plans du géographe JACQUES DE DEVENTER, exécutés sur les ordres de CHARLES-QUINT et de PHILIPPE II, reproduits en facsimilé chromographique par l'Institut national de géographie, à Bruxelles. Publication commencée par feu CH. RUELENS... et continuée sous la direction de EM. OUVERLEAUX... et J. VAN DEN GHEYN (S. J.)... (with numerous collaborators). 102 colored facsimiles of DEVENTER's plans ; 102 explanatory plans ; 3 plans by others than DEVENTER ; text. 24 livraisons in all. Bruxelles, 1884-1924. ISIS

Besides being of inestimable value to all students of the history of Belgian towns, this great cooperative facsimile atlas renders readily available an example of a remarkably detailed and extensive topographical survey carried out at a time when such surveys were exceptional. To the 7th livraison published in 1887 RUELENS contributes a biographical note on DEVENTER and a discussion of the atlas, in the course of which he observes : « DEVENTER ne songeait pas à dessiner des plans à vol d'oiseau; géographe et géomètre, il se préoccupait surtout de mettre chaque chose à sa place mathématique, de réduire ses levers à la même échelle, d'observer les proportions, en un mot, d'exécuter une œuvre de topographie pure ». J. K. W.

Fletcher, Francis. The World Encompassed : and analogous con-

temporary documents concerning Sir FRANCIS DRAKE's circumnavigation of the world. With an appreciation of the achievement by Sir RICHARD CARNAC TEMPLE. Edited by N. M. PENZER. London, Argonaut Press, 1926. ISIS

FLETCHER's work was first published in London 1628, a critical edition of it with appendices and introduction by W. S. W. VAUX was printed for the Hakluyt Society in 1854.

D. — *Medical sciences.*

Lejeune, Fritz. Die ersten fünfzig Jahre spanischer Medizin in Amerika. *Janus*, 30, 201-223, 1926. ISIS

Le plus ancien livre de médecine publié au Mexique date de 1570 : *Opera medicinalia in libris quattuor digesta*, 316 p., imprimé à Mexico par PEDRO OCHARTE; l'auteur, dont on ignore l'état civil, est FRANCISCO BRAVO DE ORSUNA; en 1578, ANTONIO RICARDO imprime à Mexico (215 p. in 8°) la *Summa y Recopilaciòn de Cirurjía*, de ALONSO LOPEZ-LOPEZ NEOHISPANICUS (1535-1597, 01, 16); le même imprimeur publie l'année suivante un *Tratado breve de Cirurjía y del conocimiento y cura de algunas enfermedades que en estra tierra más comunemente suelen aver* du Père Augustín Farfán (Mexico, 1532-1609). PEDRO OCHARTE édite en 1591 la *Primera parte de los problemas y secretos de las Indias*, de JUAN CÁRDENAS (1563 ?-1609). Puis se succèdent des œuvres de FRANCISCO HERNANDEZ (1576), HENRICO MARTINEZ (1606), JUAN DE BARRIOS (1607), FRANCISCO XIMENEZ (1615), DIEGO CISNEROS (1618). L. G.

E. — *Alia.*

Namer, Emile. Les aspects de Dieu dans la philosophie de GIORDANO BRUNO. 160 p. de la *Collection historique des grands philosophes*. Paris, FELIX ALCAN, 1926. ISIS

Roersch, Alphonse. JUSTE LIPSE. Bruxelles, Musée du Livre, 1926. ISIS

XVIIth Century (whole and first half).

A. — *Mathematics.*

Bosmans, Henri (S. J.). La théorie des équations dans l' « Invention nouvelle en l'algèbre d'ALBERT GIRARD ». *Mathesis*, p. 59-67, 100-109, 145-155, 1926 (?). ISIS

Brunschvicg, Léon. Le Génie de PASCAL. XIII+192 p. Paris, HACHETTE, 1925. ISIS

Reviewed by HÉLÈNE METZGER, *Isis*, 8, 175-176, 1926.

(Descartes, René). The geometry of RENÉ DESCARTES. Translated from the French and Latin by DAVID EUGENE SMITH and MARCIA L. LATHAM. With a facsimile of the first edition, 1637. 246 p., portrait. Chicago, Open Court, 1925. ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 173-175, 2 pl., 1926.

Dijksterhuis, Eduard Jan. Over het aandeel van ISAAC BEECKMAN (1570-1637) in de ontwikkeling der valwetten. *Nieuw Archief voor Wiskunde*, p. 186-208, Groningen, NOORDHOFF, 1926 (?). ISIS

Lloyd, Alfred H. The mathematician PASCAL, as philosopher and saint, 1623-1662. *Scientific Monthly*, 20, 139-152, 1925. ISIS

Miller, G. A. Was PAUL GULDIN a plagiarist? *Science*, 64, 204-206, 1926. ISIS

Rejoinder by D. E. SMITH; it would seem that GULDIN was a plagiarist.

Van Hée, Louis (S. J.). NAPIER's rods in China. *American Mathematical Monthly*, 33, 326-28, 1926. ISIS

The Jesuit fathers, JOHANN ADAM SCHALL VON BELL (1591-1666), a native of Cologne, and GIACOMO RHO (1593-1638), a native of Milan, held office in the Peking Astronomical Board near the close of the Ming Dynasty and were the first to introduce this device into China. Since their time it has been known under the name ch'ow suan (computing by rods) and has been highly esteemed by Chinese astronomers and mathematicians. It is discussed by MEI WEN-TING (1633-1721), the ablest Chinese mathematician of his time and the leading writer upon the history of the mathematical sciences of his people. His memoirs on the subject appeared in his collected works in sixty sections (the Li-suan-ch'uan-shu, published by WEI LI-T'UNG in 1725). Unfortunately the term ch'ow, which is used to mean the NAPIER Rods, is the same one that had long been used to mean « counters », « computing sticks », and similar devices, and hence great care is necessary in order to avoid confusion as to its precise meaning.

B. — *Physical sciences and technology.*

Korthals-Althes, J. Sir CORNELIUS VERMUYDEN. The lifework of a great Anglo-Dutchman in land-reclamation and drainage. With some notes by the author on the present condition of drainage in England and a résumé of the drainage legislation in Holland. XI+ 208 p., 15 illus., 9 maps. The Hague, W. P. VAN STOCKUM & Son, 1925. ISIS

History of a great Dutchman (his family originated from the island of Tholen in Zealand) who entered in 1621 in the service of JAMES I, to repair a breach in the great dam near Dagenham on the Thames and was soon afterwards engaged in many large schemes in his new fatherland. So large indeed that he finally ruined himself. The great pioneer died, sometime after 1656, poor and deserted. This book will interest hydraulic engineers; it concerns the historian of science only indirectly. The lessons which it contains are of practical value for there are still in England large waterlogged areas which could and ought to be reclaimed. This would make it possible to give labor to the unemployed of today and bread to the hungry mouths of tomorrow. G. S.

C. — *Natural sciences.*

(Buijsero, Cornelis). CORNELIS BUIJSERO te Bantam, 1616-1618.

Zijn brieven en journaal. Uitgegeven door J. W. IJZERMAN. XXIV+ 272 p. 's Gravenhage, MARTINUS NIJHOFF, 1923. ISIS

Caraci, Giuseppe. Di alcune antiche carte nautiche olandesi recentemente ritrovate. *L'Universo*, anno VI, 795-827, maps, 1925. ISIS

Among other important early maps recently discovered in the Bibliotheca Nazionale in Florence there are five Dutch parchment nautical charts, the work of EVERT GIJSBERTSOON and HARMEN JANSZSOON and of two hitherto unknown cartographers, CORNELIS DOETZSOON and CLAES PIETERSSOON. These reveal the existence of a school of map makers at Edam in the early 17th century.

CARACI discusses in detail three of the five maps; GIJSBERTSOON's chart of the North Sea (1601), and charts of the Atlantic Ocean and neighboring coasts by JANSZSOON (1604) and PIETERSSOON (1607). From a careful analysis of internal evidence furnished by names and topography, the conclusion is reached that the two last-named charts were largely influenced by earlier Spanish and Portuguese models, although Dutch influences played an important part in giving them their definitive form, (as shown, for instance, by Dutch place names on the coast of Guiana reflecting the colonial enterprise of the latter years of the 16th century). J. K. W.

Giardina, F. S. Un bel nome siciliano nella storia della geografia (G. B. NICOLOSI). *Bollettino della Reale Società Geografica Italiana*, serie VI, vol. I, 408-415, 1924. ISIS

A plea that greater recognition be given to the work of an important but somewhat neglected figure in the history of geography in Italy, GIAMBATTISTA NICOLOSI (1610-1670). NICOLOSI was essentially a teacher, advocating, far in advance of his time, geographical instruction by the use of maps instead of exclusively by the study of texts. While in unpublished manuscripts he expressed sympathy with the Copernican system, probably for reasons of policy he followed the Ptolemaic in his *Teoria del globo terrestre* 1642. J. K. W.

Pieris, P. E. Portuguese maps and plans of Ceylon, 1650. III+36 p. Colombo, P. E. PIERIS, 1926. ISIS

Photographic reproductions (negatives; white on black ground) of maps and plans from a manuscript volume in the Library of Congress, Washington, D. C., entitled Plantas das Fortalezas, Pagodes, &ca. da Ilha de Ceilão, and dated 1650. A rough general map of Ceylon is followed by plans of cities, forts, harbors, etc., all of extreme simplicity. J. K. W.

D. — *Medical sciences.*

Bologa, Valerius. DR. FRIEDRICH VON MONAU in Siebenbürgen. *Archiv für Geschichte der Medizin*, 18, 266-269, 1926. ISIS

FRIEDRICH VON MONAU (MONAVIUS), geb. 1592 zu Breslau, Dr. med. von Tübingen (1622), Prof. e. o. d. Med. zu Greifswald (1649-1659), gest. daselbst 1659, « omnium scientiarum cultu illustris, Verf. u. a. der bekannten Schrift 'Bronchotome, nimirum gutturio artificiose aperiendi ἐγχείρησις (1642).

Dekker, Thomas (1570?-1641?). The plague pamphlets of THOMAS DEKKER, edited by F. P. WILSON. Oxford, Clarendon Press, 1926. ISIS

Morgenthaler, W. Eine Hysterika zu Beginn des 17. Jahrhunderts. *Archiv für Gesch. der Med.*, 18, 196-201, 1926. ISIS

Apropos of the girl APOLLONIA SCHREIER of Gals, canton of Bern, Switzerland, who is said to have fasted continuously from 1601 (Aet. 17) to 1611.

Wallach, E. BACO VON VERULAM über die Medizin. Ins Deutsche übertragen aus De dignitate et augmentis scientiarum (1623), Buch IV, Kap. II. *Archiv für Geschichte der Medizin*, 18, 113-129, 1926. ISIS

E. — *Alia.*

(Burton, Robert, 1577-1640). *Oxford bibliographical society. Proceedings and papers.* Volume I, Part III. For the Society, Oxford University Press, 1925. ISIS

Part dealing with BURTON and his Anatomy of Melancholy, 1621.

Cajori, Florian. The Baconian method of scientific research. *Scientific Monthly*, 20, 85-91, 1925. ISIS

XVIIth Century (second half).

A. — *Mathematics.*

Agostini, Amedeo. La teoria dei limiti in PIETRO MENGOLI. Il concetto d'integrale definito in PIETRO MENGOLI (1625-1686). *Periodico di Matematiche*, 4, 18-30, 137-146, 1925. ISIS

Bosmans, Henri. L'Œuvre scientifique d'ANTOINE THOMAS de Namur, S. J. (1644-1709). Vice-président effectif et Président intérimaire de l'Observatoire de Péking. Première Partie : Travaux mathématiques et astronomiques. *Annales de la Société scientifique de Bruxelles*, t. 44, Mémoires, p. 169-208, 1924-1925. Deuxième Partie : La mesure d'un degré du méridien terrestre exécutée près de Péking, par THOMAS, en décembre 1702. T. 46, Volume Jubilaire, p. 154-181, 1926. ISIS

Brown, B. H. The pasturage problem of Sir ISAAC NEWTON. *The American Mathematical Monthly*, 33, p. 155, 1926. ISIS

Mahnke, Dietrich. LEIBNIZENS Synthese von Universalmathematik und Individualmetaphysik. I. Teil. 308 S. *Jahrb. Philos. und phänomenolog. Forschg.* 7 (1925), S. 305-612. Halle a. S., M. NIEMEYER, 1925 (*not seen*). ISIS

Miller, G. A. A widespread error relating to logarithms. *Science*, 64, 279, 1926. ISIS

• As far as is now known the word *mantissa* was first used as a mathema-

tical term (not by BRIGGS but) by J. WALLIS in the Latin edition of his algebra, 1693. This was more than sixty years after the death of H. BRIGGS. The word *mantissa* does appear in the English edition of this algebra, which was published eight years earlier than the Latin edition and has been said to contain the word in question. »

Newton, Isaac. Principii di filosofia naturale. Teoria della gravitazione. Con note critiche sullo svilupo dei concetti della meccanica, per cura di F. ENRIQUES e U. FORTI. 218 p., ALBERTO STOCK, Roma, 1926. ISIS

Ces extraits des *Philosophiæ Naturalis Principia Mathematica*, traduits par UMBERTO FORTI, sont précédés d'une courte notice biographique de FEDERIGO ENRIQUES. Ils contiennent une partie de la première *Prefatio*, les *Regulæ philosophiæ*, les *Definitiones*, les *Axiomata sive Leges motus*, les trois premières parties (avec des omissions volontaires) du *De Motu corporum*, le livre III (presque en entier) du *De Mundi systemata*. Suivent quatre notes historico-critiques sur le concept de masse ou de quantité de matière, sur la forme et les lois du mouvement, le mouvement, l'espace et le temps (de PARMÉNIDE à EINSTEIN), et enfin sur la mécanique de NEWTON au point de vue de la cosmologie. L. G.

B. — *Physical sciences and technology.*

Bradley, L. J. H. (NICOLAS) LE FÈVRE's « Chymistry ». *The Times Literary Supplement*, July 22, 496, 1926. ISIS

Davis, Tenney L. The first edition of the Sceptical Chymist. 2 pl. *Isis*, 8, 71-76, 1926. ISIS

Discussing various problems relative to the first edition of ROBERT BOYLE's Sceptical Chymist, London, 1661, and dealing also briefly with later edition. Facsimiles from the first and second (1680) English editions. G. S.

Early microscopes. *Isis*, 8, 163, 1926. ISIS

Henrich, F. Über das chemische Laboratorium der ehemaligen Nürnbergischen Universität in Altorf. Mit 9 Abb. *Zeitschrift f. angew. Chemie*, 39, 92-98, 1926. ISIS

Reviewed by LOCKEMANN, *Mitt. zur Geschichte der Medizin*, 229, 1926. MORITZ HOFFMANN organized a chemical laboratory in 1665 in the University pharmacy; a more elaborate laboratory was inaugurated by his son JOHANN MORITZ HOFFMANN in 1683. G. S.

Layton, Walter T. The discoverer of gas lighting. Notes on the life and work of the Rev. JOHN CLAYTON, D. D., 1657-1725. Foreword by CHARLES CARPENTER, President of the South Metropolitan Gas Company. VIII+56 p. 17 illustrations. London, WALTER KING, 1926. ISIS

The *Philos. Trans.* for 1739-1740 (vol. 41, 59-61) contained a paper on the « spirit of coals » by the late Rev. JOHN CLAYTON which was warmly praised by KING in his Treatise on the science and practice of the manufacture and distribution of coal gas (vol. 1, p. 6, 1878). Said KING : « The fore-

going account is of considerable interest, describing as it does the manufacture of gas and the production of light therefrom; the means of storing this gas, the pressure necessary to expel it to be inflamed, the facility of lighting and extinguishing, and the possibility of its being kept a considerable time without losing its inflammability.» But KING did not realize that the experiment described by CLAYTON was made as early as the end of the XVIIth century (before 1688, probably before 1686, c. 1684). This is clearly established by the author of the present monograph, a very fine piece of antiquarian research. He gives all the facts which could be ascertained about this Rev. JOHN CLAYTON (1657-1725), inducted to the rectory of Wakefield in 1687, and later in 1698, preferred to the living of St. Michan in Dublin. The Rev. JOHN. CLAYTON visited Virginia before 1686 and the *Philos. Trans.* for 1693 published an account of his «of several observables in Virginia and his voyages thither, more particulary concerning the air», (account sometimes credited to another JOHN CLAYTON, botanist born in 1693). Observations on natural gas in Lancashire had been published in the *Philos. Trans.* for 1667 by THOMAS SHIRLEY. CLAYTON'S experiment was probably inspired by SHIRLEY'S observaton; he had also made experiments with PAPIN'S digester. It is possible that his body is one of the mummies in the vaults of St. Michan which are exhibited to the sightseers of Dublin. His life does not appear in the Dictionary of National Biography. The full text of his paper on the Spirit of Coals is given in appendix. G. S.

Murray, David. (NICOLAS) LE FÈVRE'S « Chymistry ». *Times Literary Supplement*, August 5, p. 525, 1926. ISIS

Schevensteen, van. Contribution à la bibliographie des lunettes. 58 p. Aubenas, A. CHAUVIN, 1926. ISIS

« Réimpression du « Traité de l'usage des lunettes, et pièces curieuses qui dépendent de cet art, par P. BOUDON, Me. miroitier et lunettier de Castres ». Imprimé pour la première fois en 1682, à Castres, par RAYMOND BARCOUDA, imprimeur du Roi. »

(Wren, Sir Christopher). The third volume of the Wren Society, 1926. St. Paul's Cathedral, original drawings. 11 p., 37 plates. Only to subscribers. London, for the Wren Society, MILFORD, 1926. ISIS

For second volume see *Isis*, 9, 161.

C. — *Natural sciences.*

(Mortoft, Francis). His book : being his travels through France and Italy, 1658-1659. Edited by MALCOLM LETTS. XXXIV+216 p. London, Hakluyt Society, 1926. ISIS

Pernot, Hubert (*editor*). Voyage en Turquie et en Grèce du R. P. ROBERT DE DREUX, aumonier de l'ambassadeur de France (1665-1669), publié et annoté par HUBERT PERNOT. (*Collection de l'Institut Néo-Hellénique de l'Université de Paris*, fasc. 3). XI+202 p. Paris, Société d'Edition Les Belles Lettres, 1925. ISIS

Waterhouse, G. SIMON VAN DER STEL's expedition to Namaqualand, 1685. *The Geographical Journal*, 64, 298-312, pl., 1924. ISIS

Zaunick, Rudolph. Die genaue Datierung des « Edlen Fischbüchleins » (1665). *Der Angelsport*, 2, S. 24, 1926 (*not seen*). ISIS

D. — *Medical sciences.*

Martin, Alfred. The anatomy of JOHANNES VON MURALT in Zürich, Switzerland, in the year 1686. *Medical Life*, 33, 256-259, 1926. ISIS

Mauclaire, Dr. Thèses médicales de FRANCOIS LE RAT (1677) et de CLAUDE BOURDELIN (1691). *Bul. Soc. Franç. Hist. Méd.*, 20, 242-245, 1926. ISIS

E. — *Alia.*

Gouhier, Henri. La vocation de MALEBRANCHE. 174 p., gr. in-8, J. VRIN, Paris, 1926. — La philosophie de MALEBRANCHE et son expérience religieuse. 430 p., gr. in-8, J. VRIN, Paris, 1926. ISIS

« Ce livre appartient, dit l'auteur dans l'avant-propos du second volume ici signalé, à une suite d'études qui, tout en restant indépendantes les unes des autres, pourraient être réunies sous le titre général : le Cartésianisme et la pensée religieuse du XVII^e siècle ». Ces deux études sur MALEBRANCHE font suite à un livre consacré à « la pensée religieuse de DESCARTES » (*Isis*, VIII, 760), et doivent être suivies d'un travail consacré à « MALEBRANCHE et la philosophie française à la fin du XVII^e siècle». Il s'agit donc d'une entreprise de grande ampleur, et MALEBRANCHE doit être considéré, dans les deux livres qui lui sont consacrés, comme un personnage central autour duquel graviteront nombre de ses contemporains. En fait, il en est bien ainsi et les travaux de GOUHIER dépassent ce que promettent leur titre : dans le premier volume par exemple, quarante pages sont consacrées à l'Oratoire, où entre MALEBRANCHE en 1660; et c'est pour l'auteur l'occasion, documents en mains, de redresser quelques erreurs que colportent les biographies de MALEBRANCHE; car, pas un instant, même lorsqu'on semble s'en écarter, on ne quitte le père du « Système de MALEBRANCHE ». « On ne doit pas plus séparer le philosophe de sa philosophie, déclare l'auteur, que le général de ses batailles. La vie de MALEBRANCHE, c'est son œuvre, son histoire, c'est l'histoire de son esprit ». Cette déclaration indique l'esprit dans lequel est construit tout l'ouvrage de H. GOUHIER (ses deux livres n'en font qu'un), que j'estime, dès maintenant, capital pour l'histoire de la pensée religieuse à la fin du XVII^e siècle. Au point de vue bibliographique, véritable richesse. L. G.

XVIIIth Century (whole and first half).

A. — *Mathematics.*

Archibald, R. C. A rare pamphlet of MOIVRE and some of his discoveries. 7 p., facsimile. *Isis*, 8, 671-80, 1926. ISIS

Facsimile of a pamphlet issued by ABRAHAM DE MOIVRE in 1733, Approximatio ad summum terminorum binomii $(a + b)^n$ in seriem expansi,

with an introduction discussing KARL PEARSON's studies on the subject. ARCHIBALD shows that this 1733 edition was restricted to the author's friends, but MOIVRE published an English translation of it in the second and third editions of his « Doctrine of Chances » (1738, 1756). PEARSON gives priority to MOIVRE in : « 1. Presenting the first treatment of the probability integral, and essentially of the normal curve; 2. Formulating and using the theorem, improperly called STIRLING's theorem; 3. Enunciating the theorem that the measure of accuracy depends on the inverse square root of the size of the sample, so often called BERNOULLI's theorem although it is entirely due to MOIVRE. » This mathematical pamphlet of 1733, which is as rare as it is interesting, is now in a way the property of every subscriber to *Isis*. G. S.

Archibald, R. C. ABRAHAM DE MOIVRE. *Nature*, 117, 894, 1926. ISIS

Rejoinder to KARL PEARSON.

(Euler, Leonhard). LEONHARDI EULERI opera omnia sub auspiciis Societatis Scientiarum naturalium Helveticae ediderunt edenda curaverunt FERDINAND RUDIO, ADOLF KRAZER, ANDREAS SPEISER, LOUIS GUSTAVE DU PASQUIER. Series prima. Opera mathematica. Volumen septimum. Commentationes algebraicae ad theoriam combinationum et probabilitatum pertinentes edidit LOUIS GUSTAVE DU PASQUIER. LVIII+580 p. Leipzig, TEUBNER, 1923. ISIS

Reviewed in *Revue des Questions scientifiques*, avril 1926.

B. — *Physical sciences and technology.*

Davis, Tenney L. BOERHAAVE's attitude toward alchemy. *Medical Life*, 33, 261-264, 1926. ISIS

Hildebrandt, Fritz. Salpetergewinnung in Deutschland vor 200 Jahren. *Zeitschr. f. angew. Chemie*, 39, 90-92, 1926. ISIS

Lippmann, Edm. O. von. Zur ehemaligen Gewinnung des Salpeters. *Zeitschr. f. angew. Chemie*, 39, 401, 1926. ISIS

Metzger, Hélène. La philosophie de la matière chez STAHL et ses disciples. *Isis*, 8, 427-464, 2 pl., 1926. ISIS

« La théorie de la matière, chez STAHL et ses disciples, ne nous apparaît aucunement comme une construction originale et homogène sortie entièrement du cerveau d'un penseur de génie; les chimistes qui contribuèrent à lui donner son aspect caractéristique n'ont jamais prétendu innover. » Cette théorie « se présente comme une tentative de synthèse dont les matériaux sont extraits, à la suite d'un choix judicieux, des systèmes physico-chimiques qui se partageaient alors l'adhésion des savants. Il faut donc pour l'étudier la replacer dans le milieu où elle est née. » Construction de la philosophie de la matière. Statique de la mixtion. Statique de l'aggrégation. Les propriétés des éléments. La théorie des affinités.

C. — *Natural sciences.*

Behrens, Carl Friedrich. Der wohlversuchte Südländer ; Reise um

die Welt 1721-22. Nach den Originalausgaben bearbeitet von Dr. HANS PLISCHKE. (*Alte Reisen und Abenteuer*, 7). 159 p., pl. (incl. maps). Leipzig, BROCKHAUS, 1923. ISIS

BEHRENS accompanied JACOB ROGGEVEEN (1669-1729) on the latter's voyage around the world, in the course of which the first European landing on Easter Island was made. The present volume is a popular edition of BEHRENS' Reise durch die Südländer und um die Welt 1721/22, first published in Frankfurt, 1737. Dr. PLISCHKE contributes a brief introduction.
J. K. W.

Berg, L. Iz istorii otkritiya Aleutskikh ostrovov (On the history of the discovery of the Aleutian Islands). *Zemlevedenie*, t. 26, part 1-2, 114-132, Moscow, 1924. ISIS

A succinct historical sketch of the discovery of the Aleutian Islands by ALEXEI CHIRIKOV and VITUS BERING in 1741 and a list of the most important publications on the subject are followed by a brief account of voyages to these islands from 1741 to 1760. The author then gives a short description of the voyages of the ship « Adrian and Natalia » under ADRIAN TOLSTIKH in 1760-1764 from unpublished documents recently discovered in the archives on the Hydrographic Office in Leningrad. Of exceptional interest is a description of the Andreyan Islands written in 1764 at Bolshevezk, Kamchatka, from verbal reports of the Kamchatsk cossacks, PETER VASYUTINSKI and MAXIM LAZAREV, and also of the merchant ADRIAN TOLSTIKH.

It is striking that the people of the « Adrian and Natalia », unlike the earlier explorers, treated the natives in a kindly and tender manner. Because of this, during the four years of their stay on six different islands, they had no fighting. On the contrary, the natives voluntarily expressed a wish to become Russian subjects, to pay taxes, and to acknowledge the Russians as their friends. BERG also gives a description of the Andreyan Islands, together with very valuable ethnographical data on the Aleuts, from another document. This ethnographical material was collected eighty years prior to the publication of I. VENIAMINOV's Memoirs about the Islands of the Unalaska Section (in Russian), vol. 3, pp. 1-26, St. Petersburg, 1840, hitherto regarded as the first ethnographical description of these people.
N. TRANSEHE.

Hausman, Leon Augustus. The figured stones of Wurzburg. A remarkable hoax in the history of science. *Scientific Monthly*, 21, 515-521, 1925. ISIS

Apropos of the Lithographia Wirceburgensis by JOHANN BARTHOLOMÆUS ADAM BERINGER, Wurzburg 1726.

Kolb, Peter. Reise zum Vorgebirge der Guten Hoffnung, bearbeitet von PAUL GERMANN. (*Alte Reisen und Abenteuer*, 4) 159 p., illus., pl., maps. Leipzig, BROCKHAUS, 1922. ISIS

Excerpts from PETER KOLB's (1675-1726) Caput Bonæ Spei Hodiernum. KOLB spent three years (1705-1708) in carrying out « astronomical observations and studies of the fauna, flora, and inhabitants » of South Africa. The excerpts here given deal exclusively with his ethnographical observations among the Hottentots. J. K. W.

(Linné) Svenska Linné-Sällskapets Årsskrift. Årgang IX. 153 S. Uppsala, 1926. ISIS

Reviewed in *Deutsche Literaturzeitung*, 1518-20, 1926, also by ZAUNICK, in *Mit. zur Geschichte der Medizin*, 240, 1926.

Middleton, William Shainline. JOHN BARTRAM, botanist. *Scientific Monthly*, 21, 191-216, 1925. ISIS

JOHN BARTRAM, born in Darby township, Delaware county, Pennsylvania, on March 23, 1699 ; he died on September 22, 1777.

Roland, F. Les cartes anciennes de la Franche-Comté (Troisième partie). Les cartes de la Franche-Comté publiées au XVIII^e siècle. 166 p., 15 pl. Besançon, DODIVERS, 1924. ISIS

Voir 34^e Bibliographie géographique, p. 35.

D. — *Medical sciences.*

Bräuer, Kurt. Zahntechnisches bei MOUTON. Eine Betrachtung zu seinem Werk : « Essay d'Odontotechnie, ou Dissertation sur les Dents artificielles ». (Paris, 1746). *Inaugural Dissertation* zur Erlangung der Doktorwürde der Zahnheilkunde einer Hohen Medizinischen Fakultät der Universität Leipzig. 22 S. Leipzig, NOACK, 1926. ISIS

Koerbler, Georges. Contribution à l'étude d'une controverse au XVIII^e siècle. *Bul. Soc. Franç. Hist. Méd.*, 20, 172-177, 1926. ISIS

Apropos de PETAR BIANCHI, né à Raguse en 1699, médecin à Raguse et plus tard à Vienne où il mourut en 1747. Elève d'ANTONIO VALLISNIERI (1661-1730) à Padoue, il défendit la théorie animalculiste de celui-ci contre la théorie ovuliste défendue à ce moment par un autre Dalmate JEAN CHRISTOPHE PAITONI (1703-88). G. S.

Lafond, Louis. La dynastie des HELVÉTIUS. Les remèdes du roi. *Thèse*, 234 p., 8 pl., E. H. GUITARD, Paris, 1926. ISIS

JEAN FRÉDÉRIC SCHWEIZER (dit HELVÉTIUS) [Cöthen (Anhalt), 1631 - La Haye, 1709, 08, 29], venu en Hollande à dix-huit ans avec sa famille, exerça la pharmacie à La Haye, de 1661 à 1676, puis la médecine à Amsterdam, tout en s'adonnant à l'alchimie. Il eut quatre fils médecins, dont JEAN ADRIEN. La biographie et l'examen des ouvrages de celui-ci occupent la majeure partie du livre de LAFOND (pp. 19-102). JEAN ADRIEN HELVÉTIUS naquit à La Haye vers 1661 ; après un premier voyage à Paris pour lancer les remèdes secrets de son père, voyage où il n'eut pas beaucoup de succès, il en fit un second qui le décida à se fixer en France, et à y faire ses études de médecine ; le succès ne tarda pas à venir, aidé par le hasard qui mit entre ses mains cinq ou six livres d'ipecacuanha, dont il sut trouver la posologie alors ignorée, si bien qu'il obtint le 3 08 1688, par lettres-patentes du roi «le pouvoir de débiter seul son spécifique marqué à ses armes», à l'armée et dans le public. Sa fortune était ainsi établie, et son crédit : il devint médecin du neveu du roi, médecin inspecteur général des hopitaux de Flandre, conseiller du roi, fut chargé de quatre missions secrètes en Hollande, envoyé en consultation en Espagne en 1714 auprès de la reine malade,

et se vit enfin conférer en 1724 « les qualités de noblesse et d'écuyer »; il mourait trois ans après (20 02 1727). Son seul ouvrage important fut le Traité des maladies les plus fréquentes et des remèdes propres à les guérir (318 p. in-12, 1703), rapidement suivi de plusieurs éditions augmentées, et traduit en allemand, flamand, anglais et italien. D'après le compte-rendu qu'en donne LAFOND, cet ouvrage semble sans valeur. Ses autres écrits sont presque tous des recueils de prospectus, ou des instructions sur l'usage de tel ou tel remède composant ses boites de « remèdes du roi », et envoyées aux intendants par les soins d'HELVÉTIUS (ses spécialités l'ont fait considérer comme un charlatan), et plus tard par ceux de son fils JEAN CLAUDE ADRIEN, que l'auteur appelle le troisième HELVÉTIUS (Paris, 1685, 07, 12 - Versailles, 1755, 07, 17). Médecin en 1708, JEAN CLAUDE ADRIEN se fit en peu de temps une réputation brillante, fut reçu à l'académie des sciences en 1719, devint médecin consultant du roi en 1721, et premier médecin de la reine MARIE LECZINSKA en 1728. Le « quatrième HELVÉTIUS », fils de JEAN CLAUDE ADRIEN, est le philosophe CLAUDE ADRIEN (Paris, 1715, 01, 26 - 1771, 12, 27), auquel LAFOND, qui soutient une thèse de pharmacie, ne consacre que quelques pages. — Une partie de l'ouvrage est consacrée aux « remèdes du roi », à leur distribution, en Bretagne spécialement, et à leur effet. L. G.

Schmieden, Viktor. LAURENTIUS HEISTER. Ein Beitrag zur Geschichte der Chirurgie. Mit einer Tafel. *Centralblatt für Chirurgie*, Nr. 14, 1924, S. 710-718. ISIS

Reviewed by SCHAEFER, *Mitt. zur Geschichte der Medizin*, 260, 1926.

Vié, Jacques. Extraits et résumés des pièces concernant la peste de 1721-1722 dans le Gévaudan. Contenues dans une collection de mémoires de 1649 à 1722. (Archives Départementales des Hautes-Alpes). *Bul. Soc. Franç. Hist. Méd.*, 20, 111-116, 1926. ISIS

E. — *Alia.*

(Berkeley, George). Drei Dialoge zwischen Hylas und Philonous. Uebersetzt von RAOUL RICHTER. 2. Aufl. herausg. von RAYMUND SCHMIDT. (*Philos. Bibl.*, 102). X+132 S. Leipzig, F. MEINER, 1926. ISIS

(Berkeley, George). Philosophisches Tagebuch. Translated and edited with notes and an introduction by ANDREAS HECHT. Leipzig, FELIX MEINER, 1926. ISIS

Getaz, E. Le Messager boiteux de Berne et de Vevey. *Papyrus*, année 7, 403-408, Paris, 1926. ISIS

L'auteur étudie les origines de cet almanach né en 1708 et qui continue de paraître, faisant la distraction de nombreux villages suisses et même français. L'almanach étant un calendrier auquel on a ajouté des observations astronomiques, des prédictions, anecdotes et renseignements divers, l'auteur fait l'histoire du calendrier né 3000 ans avant notre ère, celle de l'almanach né en 1497, puis celle du Messager boiteux dont il donne une description soigneuse ornée de photographies reproduisant des gravures humoristiques parues dans l'almanach pendant le XVIII[e] siècle. L. LEROUX.

Lemée, Pierre. Une figure peu connue, OFFRAY DE LA METTRIE (1709-1751), médecin, philosophe, polémiste. *Ann. de la Soc. hist. et archéol. de Saint-Malo.* 52 p. Saint-Servan, J. HAIZE, 1925. ISIS

Reviewed in *Bul. Soc. fr. Hist. Méd.*, 20, 237-238, 1926.

Mandeville, Bernard (1670?-1733). The fable of the bees : or, private vices, publick benefits. With a commentary critical, historical, and explanatory, by F. B. KAYE. 2 vol. CXLVI+411+481 p. Oxford, Clarendon Press, 1924. ISIS

Reviewed by P. VAN TIEGHEM, *Revue de Synthèse Historique*, 41, 135-137, 1926.

XVIIIth Century (second half).

A. — *Mathematics.*

Bopp, Karl. JOHANN HEINRICH LAMBERTS Monatsbuch mit den zugehörigen Kommentaren sowie mit einem Vorwort über den Stand der Lambertforschung. *Abhdl. der Bayerischen Akademie, Math. Kl.*, 27, 6. 84 p., 2 pl., München, 1916. ISIS

This important publication had thus far escaped my attention. The personality of JOHANN HEINRICH LAMBERT (1728-1777) would deserve to be the subject of an elaborate monograph. In the meanwhile the diary here published, extending from 1752 to 1777, is a valuable addition to his biography. G. S.

Van Hée, Louis (S. J.). The Ch'ou-jen chuan of YÜAN YÜAN. Translated from the French manuscript by FRANCES MARGUERITE CLARKE and ANNA ELIZABETH HOUGHTALING. *Isis*, 8, 103-118, 2 pl., 1926. ISIS

Analysis, with extracts, of the Biographies of (Chinese) Mathematicians, published in 1799, — the most important Chinese source on the subject. Portrait of YÜAN YÜAN (1764-1849) and facsimile of title page. G. S.

B. — *Physical sciences and technology.*

Cajori, Florian. A notable case of finger-reckoning in America. *Isis*, 8, 325-327, 1 pl., 1926. ISIS

Apropos of the Astronomica y harmoniosa mano, a booklet published in Mexico City, 1757, by a priest, BUENAVENTURA FRANCISCO DE OSSORIO, explaining an ingenious and simple way of solving calendar problems. G. S.

Gutbier, Alexander. GOETHE, Grossherzog CARL AUGUST und die Chemie in Jena. Rede, gehalten zur Feier der akademischen Preisverteilung am 19 Juni 1926. Mit einem neu aufgefundenen Brief DÖBEREINERS an GOETHE. (Jenaer akademische Reden, Heft 2). VI+66 S., 3 Taf. Jena, FISCHER, 1926. ISIS

Klinckowstroem, Graf Carl von. JOHANN WILHELM RITTER zu seinem

150. Geburtstage. *Mitteilungen zur Geschichte der Medizin*, 25, 198-201, 1926. ISIS

Schmidt, Heinrich. Die Kant-Laplace'sche Theorie. Ideen zur Weltentstehung von IMMANUEL KANT und PIERRE LAPLACE. (*Kröners Taschenausgabe*, Bd. 46). XX+228 S., 2 Bildn. Leipzig, A. KRÖNER, 1925. ISIS

Speter, Max. Kritisches über die Entstehung von LAVOISIERS System. *Zeitschr. f. angew. Chemie*, 39, 578-582, 1926. ISIS

Reviewed by LOCKEMANN, *Mitt. zur Geschichte der Medizin*, 25, 232, 1926.

C. — *Natural sciences.*

(Bonnet, Charles). Letter to H. B. DE SAUSSURE, dated Genthod, December 16, 1777, apropos of HALLER's death. Edited by CHARLES GREENE CUMSTON. *Annals of Medical History*, 8, 186-187, 1926 (portrait). ISIS

Bougainville, Louis Antoine de. (1729-1811). Voyage de BOUGAINVILLE autour du monde pendant les années 1766, 1767, 1768 et 1769. Préface et notes de P. DESLANDRES. (Collection des voyages de jadis et d'aujourd'hui). X+304 p., 8 pl. Paris, PIERRE ROGER, 1924. ISIS

Incomplete and expurgated edition hastily produced. The editor's superficiality is illustrated by the fact that he gives us the portrait, not of this Bougainville, but of another ! G. S.

Collot, Victor. A journey in North America, containing a survey of the countries watered by the Mississippi, Ohio, Missouri, and other affluing rivers. Illustrated by 36 maps, plans, views and divers cuts. With an introduction and a critical index, also a translation of the appendix from the French edition, by J. CHRISTIAN BAY. 2 vol. and atlas. (Reprints of rare Americana, no. 4). Firenze, O. LANGE, 1924. ISIS

Reprint of volumes and atlas first published in 1826 recording the unusually close and accurate observations of COLLOT made in the valleys of the Ohio and Mississippi Rivers during a journey from Philadelphia to New Orleans in 1796 in the interest of French colonial ambitions. J.K.W.

(Cook, Captain **James).** MATTHEW BOULTON'S « Otaheite » medal. Distributed by Captain COOK on his second voyage to the Pacific Ocean, 1772. 11 p. Birmingham, for the Assay Office, CORNISH Brothers, 1926. ISIS

Hobbs, William H. JAMES HUTTON, the pioneer of modern geology. *Science*, 64, 261-265, 1926. ISIS

Lucas, Frederick, A. THOMAS JEFFERSON, palaeontologist. *Natural History*, 26, 328-330, 1926. ISIS

« WASHINGTON will ever be known as the Father of His Country, but JEFFERSON may well claim to be the Father of (American) Palæontology. Others described fossils sent them from America, but JEFFERSON was among the first to pay them careful attention, and the first and only president to bring them to the White House. « Dolly » Madison, so we are told, found the big east room of the White House convenient for drying clothes; JEFFERSON used it for laying out the bones which he had secured from the famous Big Bone Lick, Kentucky, and many a palæontologist has wished he had similar space for his material. This may be called the first Palæontological Laboratory in America ».

Park, Mungo. Von Gambia zum Niger, bearbeitet von PAUL GERMANN. (*Alte Reisen und Abenteuer*, 12). 158 p., plates, illustrations, maps. Leipzig, BROCKHAUS, 1924. ISIS

German translation of passages from MUNGO PARK's travels (1795-1796) with introduction by the editor. J. K. W.

Roule, Louis. CUVIER et la science de la nature. 246 p. Paris, ERNEST FLAMMARION, 1926 (9 fr.). ISIS

Comme vulgarisation d'un aspect de l'histoire des sciences, ce livre, qui constitue le troisième d'une série (voyez *Isis*, VII, 226; VIII, 769) est à recommander. ROULE a très bien compris les influences qui ont agi sur CUVIER, depuis son enfance à Montbéliard jusqu'à son apothéose à Paris, et la première partie, concernant la vie de CUVIER, est particulièrement bien faite. Le style redondant de ROULE est moins heureux quand il s'agit de présenter l'œuvre de CUVIER, et l'on ne peut manquer de regretter l'absence du moindre esprit critique dans cette seconde partie du livre. L'auteur ne place pas CUVIER dans le milieu scientifique de son temps et, le présentant en maître, ne le critique pas assez comme savant. Quant à la troisième partie du livre — La science concrète de la nature et ses premières vues —, je n'arrive pas à saisir de rapport avec l'œuvre de CUVIER. Les vues exprimées ici catégoriquement sont de celles que CUVIER n'a jamais acceptées, et que peu de chercheurs acceptent aujourd'hui. Des conceptions sur la succession des êtres comme (p. 217) : « La quatrième phase eut lieu quand les grands végétaux Cryptogames, les Insectes et les Amphibiens primitifs, effectuant la première conquête des terres et des airs, s'établirent sur les continents. » sont particulières à ROULE, mais n'ont rien à voir avec les idées générales de CUVIER. R. M. MAY.

D. — *Medical sciences.*

Bragman, Louis J. The obstetrical opinions of WALTER SHANDY. *Medical Life*, 33, 269-274, 1926. ISIS

A propos of LAWRENCE STERNE's famous novel, 1759. G. S.

Dagen, Georges. Un dentiste ambulant guillotiné en 1793. Etudes et recherches sur l'art dentaire à Paris pendant la Révolution. ***Bul. Soc. Fr. Hist. Méd.***, 20, 286-289, 1926. ISIS

Darmstaedter, E. Der Dichter der « Jobsiade », KARL ARNOLD KOR-

TUM (1745-1824) als Arzt und Medizinhistoriker. *Archiv für Geschichte der Medizin*, 18, 270-272, 1926. ISIS

Diller, Theodore. Pioneer medicine in western Pennsylvania. Part I. *Annals of Medical History*, 8, 141-154, 6 portraits, 1926. ISIS

Haustein, Hans. Zur Bekämpfung der Geschlechtskrankheiten in Berlin im 18. Jahrhundert. Eine vorläufige Mitteilung. *Archiv für Geschichte der Medizin*, 18, 251-260, 1926. ISIS

Lint, J. G. de. DAVID HENRY GALLANDAT. *Bijdragen tot de geschiedenis der geneeskunde*, 6, 181-191, 1926. ISIS

Born at Yverdun, Lake of Neuchâtel 1732; died 1782. Physician in Flushing, Netherlands. Bibliography. G. S.

Renaud, H. P. J. Un nouveau document marocain sur la peste de 1799. *Hespéris, Archives berbères et Bull. de l'Institut des hautes études marocaines*, 1er trimestre 1925, 83-90. ISIS

Schevensteen, van. Les statuts du collège de la chirurgie à la fin de l'ancien régime et l'état de la corporation des chirurgiens-barbiers à Anvers en 1784. *Bull. Soc. fr. Hist. Méd.*, 20, 100-110, 205-217, 1926. ISIS

Sérieux, Paul et **Goulard, Roger.** Le service médical de la Bastille. *Bul. Soc. franç. Hist. Méd.*, 20, 117-134, 1926. ISIS

Zeiss, H. Heilmittelanpreisung vor 150 Jahren. *Mitteilungen zur Geschichte der Medizin*, 264-266, 1926. ISIS

E. — *Alia.*

Adickes, Erich. KANT als Naturforscher. Bd. I, XX+378 S. Bd. II. VII+494 S. Berlin, WALTER DE GRUYTER, 1924-1925. ISIS

Reviewed by H. WIELEITNER, *Isis*, 8, 355-358, 1926.

Ducros, Louis. French society in the eighteenth century. Translated from the French by W. DE GEIJER. London, BELL, 1926. ISIS

Hirst, Francis Wrigley. Life and letters of THOMAS JEFFERSON. XVIII+588 p., portraits, plates, facsimile and map. New York, MACMILLAN, 1926. ISIS

Reviewed by DICE R. ANDERSON in the *American Historical Review*, 13, 799-801, 1926.

Œser, Max. Kurzer Führer durch die Bibliothek DESBILLONS und die ihr angeschlossenen Büchersammlungen. Städt. Schloss-Bücherei

Mannheim. Einleitung zum Katalog. 34 S., 5 Tfln., 11 Abb. Mannheim, Städt. Schlossb., 1926. ISIS

Library of (FRANÇOIS JOSEPH TERRASSE) DESBILLONS (S. J.), born in Châteauneuf, Berry, 1711; died at Mannheim in 1789. DESBILLONS was nicknamed « the Latin La Fontaine ».

XIXth Century (whole and first half).

B. — *Physical sciences and technology.*

Adolph, Edward F. JULIUS ROBERT MAYER and the blood's circulation rate. *Science*, 63, 626-629, 1926. ISIS

Baker, Ray Palmer. Rensselaer Polytechnic Institute and the beginnings of science in the United States. *Scientific Monthly*, 19, 337-355, 1924. ISIS

Founded at Troy, New York, in 1824, by STEPHEN VAN RENSSELAER, and first headed by AMOS EATON (1766-1842). Many portraits. G. S.

Bjerrum, Niels, Die Entdeckung des Aluminiums. *Zeitschr. f. angew. Chemie*, 39, 316-317, 1926. ISIS

Evieux, E. Le centenaire de la découverte de l'outremer artificiel. *La Revue des produits chimiques*, 31 juillet 1926, 471-474. ISIS

La découverte de J. B. GUIMET, signalée à l'Académie des Sciences le 4 février 1828, fut faite dès 1826, donc avant GMELIN (1827). Ceci est établi par son cahier d'expériences et sa correspondance. JEAN BAPTISTE GUIMET naquit à Voiron, Isère, en 1795; il mourut en 1871. Cet article (signé A. VIOLET) contient une biographie de GUIMET et une longue bibliographie de l'outremer. Le même auteur a consacré un autre article à GUIMET dans *le Salut Public*, Lyon, 3 juillet 1926. Grâce à l'exploitation industrielle de sa découverte, GUIMET avait amassé une grande fortune qui fut encore augmentée par son fils EMILE ETIENNE GUIMET (1836-1918,) qui lui succéda. Ce fils fonda en 1879 le Musée Guimet, d'abord installé à Lyon, et transféré à Paris en 1885. Ce Musée est l'un des plus grands centres pour l'étude des religions. G. S.

Goldschmidt, Karl (1857-1926). Nochmals « die Entdeckung des Aluminiums ». *Zeitschr. f. angew. Chemie*, 39, 375-376, 1926. ISIS

See *Isis*, 9, 170.

Guinchant, Joseph. A propos de l'invention de l'électro-aimant. *Revue Générale des Sciences*, May 30, p. 290, 1926. ISIS

See L. RÉVERCHON, *Isis*, 9, 171.

(Helmholtz, Hermann von, 1821-1894). Treatise on physiological optics. Translated from the third German edition. Edited by JAMES POWELL COCKE SOUTHALL. Vol. 3. The perceptions of vision. XI+736 p., 6 plates. Optical Society of America, Rockefeller Hall, Ithaca, New York, 1925. ISIS

This volume completes the English edition which contains much additional material. The first volume appeared in 1924 (*Isis*, 7, 598).

Picard, Emile. Les théories de l'optique et l'œuvre d'HIPPOLYTE FIZEAU (1819-1896). Lue dans la séance publique annuelle du 17 décembre 1923 de l'Académie des Sciences. 55 p. Paris, GAUTHIER-VILLARS, 1923. ISIS

A propos de l'œuvre si féconde de FIZEAU, l'auteur discute l'évolution des théories optiques jusqu'à nos jours. Suivi d'une bibliographie des travaux scientifiques de FIZEAU (1840 à 1895), et des articles qui lui ont été consacrés. G. S.

Potonniée, Georges. Histoire de la découverte de la photographie. 322 p., 99 fig. Paris, Paul MONTEL, 1925. ISIS

Reviewed by L. GUINET, *Isis*, 8, 511-513, 1926.

Timerding, Heinrich. ROBERT MAYER und die Entdeckung des Energiegesetzes. (*Schriften zur angewandten Seelenkunde*. Hrsg. von SIGM. FREUD, 20 Heft). IV+120 S. Leipzig. ISIS

Mit. zur Geschichte der Medizin, 25, 161, 1926. (H. WIELEITNER).

Turner, Dorothy M. PETER MARK ROGET and the voltaic cell. *Nature*, 117, May 22, 1926. ISIS

« It is of interest to find the principle of energy applied to the study of the voltaic cell by PETER MARK ROGET (1779-1869) so early as 1829. This was before the experiments of FARADAY on electrolysis, and nearly ten years before the work of JOULE on the energetics of a voltaic cell. »

Walden, Paul. « 100 Jahre Benzol ». Das Benzol als wissenschaftliches Problem und welwirtschaftlicher Faktor, Betrachtungen zur Jahrhundertfeier seiner Entdeckung. *Zeitschr. f. angew. Chemie*, 39, 125-132, 1926. ISIS

Reviewed by LOCKEMANN, *Mitt. zur Gesch. der Medizin*, 231, 1926.

C. — *Natural sciences.*

Bassi, Agostino. Opere di AGOSTINO BASSI (n. a Mairago, 1773, m. a Lodi, 1856) scelte e pubblicate a cura del Comitato nazionale per la ristampa, auspice la Società medico-chirurgica di Pavia. LXVIII+676 p., 1 portrait. Tipografia cooperativa di Pavia, 1925. ISIS

Reviewed by L. GUINET, *Isis*, 8, 497-498, 1926.

Chamisso, Adelbert von. Entdeckungsreise um die Welt 1815-1818. Bearbeitet von MAX ROHRER. Mit Bildern von CHAMISSO und CHORIS. IV+339 S. München, Alpenfreund-Verlag A.-G., 1925. ISIS

Fiechter, Alfredo. L'Istituto Geografico Militare di Vienna : origine, attività, fine. *L'Universo*, anno V, 793-808, 1 pl., 1924. ISIS

The Austrian K. K. Militärgeographisches Institut had its origins in northern Italy in surveys undertaken during the Napoleonic era (see also *Isis*, 6, 169, under ADAMI, V.; 7, 302, under MORI, A.). Established in 1814, headquarters were maintained in Milan until 1839, when they were transfered to Vienna. The Institute subsequently « became the most important and best organized of all similar institutions in Europe and served as model for many ». Since the dissolution of the Austro-Hungarian Empire the work of the Institute has been broken up. J. K. W.

(Johnston, Alexander Keith, 1804-1871). One hundred years of map making. The story of W. and A. K. JOHNSTON. 20 p., 3 pl. Edinburgh, printed by W. & A. K. JOHNSTON, limited, Edina Works, n. d. (1926?) ISIS

Brief historical sketch of one of the leading map publishing houses in Great Britain, founded by the brilliant Scotch cartographer, ALEXANDER KEITH JOHNSTON, author of the National Atlas (1834, 2nd. ed. 1855), the Physical Atlas (1848, 2nd ed. 1856), the Royal Atlas (1861 ff.). JOHNSTON is also said to have constructed the first physical globe. J. K. W.

Menetrier, M. P. Documents inédits concernant FRANÇOIS MAGENDIE. *Bul. Soc. Fr. Hist. Méd.*, 20, 251-258, 1926. ISIS

Müller, Martin. Ueber die philosophischen Anschauungen des Naturforschers JOHANNES MÜLLER. *Archiv für Geschichte der Medizin*, 18, 130-150, 209-234, 1926. ISIS

Scholkalsky, J. The Russian Antartic expedition under T. H. BELLINGSHAUSEN, 1819-1821. *Bulletin of the Geographical Society of Philadelphia*, 22, 121-133, 1 pl., 1 diagram, 1924. ISIS

In addition to surveys of the South Georgia and the South Shetland Islands and to the discovery of various islands and of Alexander I Land, BELLINGSHAUSEN confirmed Captain JAMES COOK's demonstration of the absence of land between New Zealand and South America between latitude 60° S. and the Antarctic circle. J. K. W.

Wagner, Henry Raup. The plains and the Rockies. A bibliography of original narratives of travel and adventure, 1800-1865. 193 p. San Francisco, JOHN HOWELL, 1921. ISIS

Zaunick, Rudolph. Zwei Briefe LORENZ OKENS an CARL GUSTAV CARUS. Ein Beitrag zu CARUS' Gesamtwürdigung als Biologen. *Mitteilungen zur Geschichte der Medizin*, 25, 141-146, 205-213, 1926. ISIS

D. — *Medical sciences.*

Beard, J. Howard. The medical observations and practice of LEWIS and CLARK. *Scientific Monthly*, 20, 506-526, 1925. ISIS

Dealing with MERIWETHER LEWIS (1774-1809) and WILLIAM CLARK (1770-1838), explorers of the American West in 1804-1806. G. S.

Gibbon, John H. SAMUEL D. GROSS (1805-1884). *Annals of Medical History*, 8, 136-140, 1926. ISIS

American surgeon. G. S.

Guinet, L. EMILE LITTRÉ (1801-1881). *Isis*, 8, p. 77-102, 1926. ISIS

Biographie bien documentée et sympathique de l'admirable homme que fut LITTRÉ. Portrait. G. S.

Howell, W. B. Concerning some old medical journals. *Annals of Medical History*, 8, 155-175, 1926. ISIS

Dealing mainly with *the Lancet*.

Julien, Ch. André. Un médecin romantique, interprète et professeur d'arabe : EUSÈBE DE SALLES (1796-1873). Extr. de la *Revue Africaine*. 164 p. Alger, J. CARBONEL, 1924-1925. ISIS

Reviewed by H. P. J. RENAUD, *Bul. Soc. fr. Hist. Méd*, 20, 230-232, 1926.

(Laënnec, (René) Théophile (Hyacinthe). Quimper, 1781-Kerlouarnec, 1826). LAËNNEC Centenary, *Boston Medical History Club*, May 10, 1926. 27 p. Reprinted from the *Boston Medical and Surgical Journal*, July 29, 1926. ISIS

LAËNNEC, the man, by WILLIAM PEARCE COUES ; LAËNNEC's clinico-pathological studies, by HYMAN MORRISON; some editions of LAËNNEC's work on mediate ausculation, by HENRY R. VIETS. Facsimile of the title page of the first edition of De l'auscultation médiate. Tome premier, Paris 1819.

E. — *Alia.*

(Reichenbach, Baron **Carl von,** 1788-1869). REICHENBACH's letters on od and magnetism (1852). Published for the first time in English, with extracts from his other works, so as to make a complete presentation of the Odic Theory. Translated text, introduction, with biography of Baron CARL VON REICHENBACH, notes and supplements by F. D. O'BYRNE. LXXII+119 p. London, HUTCHINSON, 1926. ISIS

Segond, J. Le Saint-Simonisme d'AUGUSTE COMTE et le but pratique de la sociologie. *Revue de Synthèse Historique*, 41, 63-80, 1926. ISIS

XIXth Century (second half).

A. — *Mathematics.*

Bjerknes, V. CARL ANTON BJERKNES (1825-1903), hans liv og arbeide traek av norsk kulturhistorie i det nittende aarhundrede. VI+240 p. Oslo, ASCHEHOUG, 1925. ISIS

Reviewed by FRIEDR. ENGEL, *Deutsche Literaturzeitung*, 1633-1636, 1926.

Bosmans, Henri. CAMILLE JORDAN (1838-1922). *Revue des Questions scientifiques*, janvier 1926.

Marcolongo, Roberto. GIOVANNI FRATTINI (1852-1925). *Bollettino di Matematica*, anno 22, 41-48, 1926. ISIS

With long bibliography of FRATTINI's mathematical writings.

(Picard, Emile). Discours prononcés dans la séance publique tenue par l'Académie française pour la réception de M. EMILE PICARD, le jeudi 11 février 1926. 86 p. in quarto. Paris, FIRMIN DIDOT, 1926. ISIS

Le discours de l'illustre récipiendaire était consacré, selon la coutume à son prédécesseur, CHARLES DE SAULSES DE FREYCINET, mathématicien, philosophe, administrateur, homme d'état. FREYCINET naquit à Foix le 14 novembre 1828; il mourut à Paris en 1923. Elève de l'Ecole polytechnique et de l'Ecole des mines, ses nombreuses occupations professionnelles ne l'empêchèrent pas d'écrire un Traité de mécanique rationnelle (1858) qui fut fort estimé. Il discuta les bases de la géométrie et de la mécanique; on peut dire que l'étude de la philosophie de la science fut la grande récréation de sa vie si active et si remplie. La réponse du directeur de l'académie, le romancier MARCEL PRÉVOST, est superficielle à souhait. Tout en déclarant son ignorance des mathématiques, PRÉVOST essaye de persuader ses auditeurs qu'il en sait beaucoup plus que sa modestie ne lui permet de l'avouer. Il fait à ce sujet de nombreuses remarques, qui durent paraitre profondes à une audience mondaine, mais qui sont en réalité puériles. Il est certain que PRÉVOST eut mieux fait de ne pas s'aventurer dans ce domaine. Un très beau portrait de la noble figure de FREYCINET sert de frontispice.

G. S.

Picard, Emile. La vie et l'œuvre de JULES TANNERY (1848-1910), membre de l'Institut. Lecture faite en la séance annuelle du 14 décembre 1925 de l'Académie des Sciences. 32 p. avec un portrait de JULES TANNERY hors texte. Paris, GAUTHIER-VILLARS, 1925. ISIS

Picard, Emile. Notice historique sur GASTON DARBOUX (Nîmes, 1842-1917). Lue dans la séance publique annuelle du 10 décembre 1917 de l'Académie des Sciences. 36 p., portrait hors-texte. Paris, GAUTHIER-VILLARS, 1917. ISIS

Roever, William Henry. WILLIAM CHAUVENET. *Science*, 64, 24-28, 1926. ISIS

Born in 1820, died in 1870; it was largely through his efforts that the U. S. Naval Academy was established, at Annapolis, Maryland. G. S.

B. — *Physical sciences and technology.*

Cannizzaro, Stanislao (1826-1910). Italian Chemical Congress at Palermo and the Cannizzaro Centenary. *Nature*, 117, June 12, p. 840, 1926. ISIS

Copley, Frank Barkley. FREDERICK WINSLOW TAYLOR (1856-1915), father of scientific management. 2 vol. New York, HARPER, 1923. ISIS

Flammarion, Camille (Montigny-le-Roi, Haute-Marne, 1842, 02, 26; Juvisy, S. et O., 1925, 06, 03). *L'Astronomie*, bulletin de la Société astronomique de France, fondée par FLAMMARION en 1887, et dont il était resté le Secrétaire général, lui consacre son N° de juillet 1925 (tiré à part de 64 p.) ISIS

On y trouve une bonne étude biographique due à EMILE TOULET (25 p.), les discours prononcés aux obsèques, notamment par B. BAILLAUD, CH. LALLEMAND, P. PAINLEVÉ, et six portraits de FLAMMARION, échelonnés entre les âges de vingt et quatre vingt deux ans. CAMILLE FLAMMARION, qui fut sans conteste, par ses conférences et ses livres, un des plus grands créateurs de vocations astronomiques, a été inhumé dans le parc de l'observatoire de Juvisy, qu'il avait pu fonder en 1882 grâce à la générosité d'un admirateur, et d'où sont sorties ses études sur Mars, ses observations des surfaces planétaires, des nébuleuses, ses photographies des comètes, des éclipses, etc. — L'avenir de l'observatoire de Juvisy semble assuré par les concours apportés par les amis et les admirateurs de FLAMMARION et par l'énergie de Mme FLAMMARION. L. G.

Mathias, E. H. KAMERLINGH ONNES (1853-1926). L'Œuvre et l'homme. *Revue Générale des Sciences*, Mai 30, p. 294-298, 1926. ISIS

Picard, Emile. La vie et l'œuvre de PIERRE DUHEM (1861-1916). Notice lue dans la séance publique annuelle du 12 décembre 1921, de l'Académie des Sciences. 44 p., portrait hors-texte. Paris, GAUTHIER-VILLARS, 1921. ISIS

Picard Emile. Notice historique sur la vie et l'œuvre de LORD KELVIN (1824-1907). 39 p. Lue dans la séance publique annuelle du 22 décembre 1919, de l'Académie des Sciences. Paris, GAUTHIER-VILLARS 1919. ISIS

Rayleigh (Robert John Strutt, fourth baron). The life of JOHN WILLIAM STRUTT, Third Baron RAYLEIGH, O. M., sometime President of the Royal Society and Chancellor of the University of Cambridge. With portraits. 1 vol. London, Arnold, 1924. ISIS

Reviewed by NORMAN R. CAMPBELL, *Isis*, 8, 177-181, 1926.

Schiaparelli, Giovanni (1835-1910). Scritti sulla storia dell'astronomia antica. Parte prima. Scritte editi. T. 1, VIII+462 p., 1 portrait, 2 facsimile. Bologna, NICOLA ZANICHELLI, 1925. ISIS

Reviewed by L. GUINET, *Isis*, 8, 503-506, 1926.

C. — *Natural sciences.*

Bazin, René. CHARLES DE FOUCAULD (1858-1916), hermit and explorer.

Translated by PETER KEELAN. VIII+356 p. London, BURNS, OATES and WASHBOURNE, 1923. ISIS

For the original work, Paris 1921, see *Isis*, 5, 242.

Beccari, Odoardo (1843-1920). Nuova Guinea, Selebes e Molucche. Diarii di viaggio ordinati dal figlio NELLO BECCARI, con introduzione e note di LUIGI BUSCALIONI. XXXVIII+468 p., 22 pl., 53 fig., and maps. Firenze, Soc. Editrice La Voce, 1924. ISIS

See 34e Bibliographie géographique, p. 9.

Bower, Frederick Orpen. Seven decades of botany. From the presidential address to Section K (Botany) of the British Association entitled « 1860-1894-1926 », delivered at Oxford on August 5. *Nature*, 118, 413-416, 1926. ISIS

Burton, Sir **Richard Francis** (1821-1890). Selected papers on anthropology, travel and exploration. Now edited with an introduction and occasional notes by N. M. PENZER. 240 p. New York, ROBERT M. MCBRIDE, 1924. ISIS

The papers here selected for reprint are chosen partly because they « are rare and interesting » and partly as giving « an insight into the varied activities and achievements of BURTON's crowded life ». Of especial value to the historian of science is an « intimate account of the great Italian Egyptologist » and « the first man to excavate the Valley of the Kings », GIOVANNI BATTISTA BELZONI (1778-1823). This account was first published in the *Cornhill Magazine*, vol. 42, pp. 36-50. Particularly interesting is the « unique account of his (BELZONI's) attempt to reach Timbuctoo ».

Cajal, Santiago Ramón y. Charlas de café. 3a Edicion. 383 p. Madrid, property of the author (Imprenta de JUAN PUEYO), 1922. ISIS

Reviewed by RAOUL M. MAY, *Isis*, 8, 498-503, 1926.

Cajal, Santiago Ramón y. Recuerdos de mi vida. 3a Edicion. 445 p., 80 pls. Madrid, property of the author (Imprenta de JUAN PUEYO), 1923. ISIS

Reviewed by RAOUL M. MAY, *Isis*, 8, 498-503, 1926.

Ferton, Charles (1856-1921). La vie des abeilles et des guêpes. Œuvres choisies, groupées et annotées par ETIENNE RABAUD et FRANÇOIS PICARD. XVI+376 p., 72 fig. Paris, ET. CHIRON, 1923. ISIS

Reviewed by L. GUINET, *Isis*, 8, 191-192, 1926.

Goebel, Karl von. WILHELM HOFMEISTER : the work and the life of a nineteenth century botanist. With biographical supplement by Frau GANZENMÜLLER. Translated into English by H. M. BOWER and edited botanically by F. O. BOWER. (Ray Society Volume (No. 111) for 1925). XI+202 p. London, DULAU and Co., 1926. ISIS

See *Isis*, 8, 777.

Green, Fitzhugh. (ROBERT EDWIN) PEARY, the man who refused to fail. New York, PUTNAM, 1926. ISIS

Haberlandt, G. Gedächtnisrede auf SIMON SCHWENDERER. *Abhld. der Preussischen Akademie, Physik. Klasse.* 12 S. Berlin, 1919. ISIS

Botanist born in the St. Gallen canton in 1829; died in 1919.

Hastings, A. C. G. The voyage of the Dayspring. Being the journal of the late Sir JOHN HAWLEY GLOVER : 1857. London, LANE, 1926. ISIS

This is the « Journal of the late Sir JOHN HAWLEY GLOVER, R. N., G. C. M. G., together with some account of the expedition up the Niger River in 1857 by Mr. HASTINGS ».

Hedin, Sven. General PRSCHEWALSKIJ in Innerasien. (*Reisen und Abenteuer*, 19). 159 p., illustrated. Leipzig, BROCKHAUS, 1922. ISIS

Abridged translation of the account of the fourth expedition of general NIKOLAI MIKHAILOVICH PRZHEVALSKII (1839-1888) in Central Asia.

Jitkov, B. Kistorii issledovanii Russkogo Severa (On the history of the exploration of the Russian North). *Zemlevedenie*, 26, 159-180, Moscow, 1924. ISIS

The brief French résumé indicates that this article is a critical discussion of certain scientific and industrial explorations of northern Russia which have not succeeded « soit à cause d'une insuffisance de l'organisation, soit du manque de sens pratique des initiateurs ». The expeditions of M. S. SIDOROV between the Yenisei and Pechora Rivers across the Ural Mountains from 1859 to 1864, and of A. V. JURAVSKI between the northern Ural Mountains and the Pechora River 1904-1908, are described in detail. J. K. W.

Kolaček, František; Woldřich, Jos. FERDINAND STOLICZKA (1838-1874). (*Sbornik Čs. společnosti zemepisné*, t. 30). 14 p. Praha, 1924. ISIS

In Czech but with French summary. FERDINAND STOLICZKA (1838-1874) born in Moravia, was attached to the Geological Survey of India. G. S.

Kruber, A. Pamyati DMITRIYA NIKOLAEVICHA ANUCHINA (DIMITRI NIKOLAEVICH ANUCHIN : a memorial). *Zemlevedenie*, 26, 7-46, portraits, Moscow, 1924. ISIS

ANUCHIN (1843-1923) was a geographer, archeologist, and ethnologist, professor at the University of Moscow, founder of its Anthropological Museum, founder and editor of the scientific periodical *Zemlevedenie* (Geography), and author of numerous works. KRUBER points out that while not an original thinker, ANUCHIN's great merit was to clarify and systematize the work of his predecessors in such a way that geography for the first time in Russia was established on a truly scientific basis. J. K. W.

Leidy, Joseph (1823-91). The JOSEPH LEIDY commemorative meeting. Held in Phildelphia, December 6, 1923. 88 p. ISIS

This handsome publication illustrated with a photograph of the LEIDY memorial medal gives an account of the commemorative meeting and contains the following contributions: HENRY B. WARD. JOSEPH LEIDY, the founder of American parasitology; EDWARD S. MORSE. General estimate of LEIDY's influence upon scientific thought and development; HERBERT S. JENNINGS. Zoological work; WILLIAM B. SCOTT. Palæontological and geological work; WITMER STONE. JOSEPH LEIDY as a botanist; FRANK W. CLARKE. Mineralogical work; HENRY FAIRFIELD OSBORN. JOSEPH LEIDY, founder of vertebrate palæontology in America; GEORGE E. DE SCHWEINITZ. Reminiscences of a prosector and appreciation of LEIDY's work as an anatomist; HOBART A. HARE. LEIDY and his influence on medical science.

Locy, William A. WILHELM HOFMEISTER (1824-1877). *Scientific Monthly*, 19, 380-389, 1924. ISIS

Margerie, Emm. de. L'Œuvre géographique de FRANZ SCHRADER. Compte-rendu du Congrès International de Géographie (Le Caire), 2, 37-51, 8 pl., Cairo, 1925. ISIS

Scholarly appreciation of SCHRADER (1844-1924), whose most noteworthy work lay in the field of topography and cartography. His maps and panoramas of the Pyrenees have a touch of distinctively individual genius. He was also author and co-author of several important atlases and editor of L'Année Cartographique (*Isis*, 9, 173). J. K. W.

Maurer, Friedrich. CARL GEGENBAUR: Rede zum Gedächtnis seines hundertsten Geburtsjahres, gehalten im Hörsaal der Anatomischen Anstalt in Heidelberg am 19 April 1926. (Sonderabdruck aus *Jenaische Zeitschrift für Naturwissenschaft*, Band 62). II+18 S., 3 Taf. Jena, GUSTAV FISCHER, 1926. ISIS

Morgan, T. H. WILLIAM BATESON. *Science*, 63, May 28, 531-535, 1926. ISIS

Osborn, Henry Fairfield. Impressions of great naturalists. XXVIII+216 p., 12 portraits. New York, CHARLES SCRIBNER's Sons, 1924. ISIS

Reviewed by RAOUL M. MAY, *Isis*, 8, 188-189, 1926.

Osborn, Henry Fairfield. The problem of the origin of the species as it appeared to DARWIN in 1859 and as it appears today. *Nature*, 118, 270-273, 1926. ISIS

Pearson, Karl. The life, letters and labours of FRANCIS GALTON. Vol. 1. Birth 1822 to marriage 1853. XXIV+248 p., 72 pl. Vol. 2. Researches of middle life. XII+425 p., 56 pl. Cambridge, University Press, 1914-1924. ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 181-188, 1926, with portrait of GALTON, Ae. 81.

Poisson, Charles (S. J.). Les publications du R. P. ELIE COLIN, membre correspondant de l'Institut, fondateur et premier directeur de

l'observatoire de Tananarive. Essai bibliographique 1889-1923. S. l. n. d. 36 p. ISIS

Voir 34e Bibliographie géographique, p. 33.

Praesent, Hans. JOSEF PARTSCH (1851-1925) zum Gedächtnis (Mit Bild). *Mitt. d. Geogr. Ges. in München*, 19, 202-211, 1926. ISIS

Roux, Emile. The medical work of PASTEUR. *Scientific Monthly*, 21, 365-389, 1925. ISIS

The original French text appeared in 1896.

Tharaldsen, C. E. WILLIAM ALBERT LOCY (1857-1924), zoologist and historian of biological science. *Scientific Monthly*, 21, 478-486, 1925. ISIS

Thurston, Basset. The first crossing of Fiji. *The Geographical Journal*, 64, 394-403, 1924. ISIS

The interior of Viti Levu, the largest island in the Fiji Archipelago, remained unexplored until 1865, when it was crossed by a party led by Capt. H. M. JONES. The diary kept by Mr. (later Sir) J. B. THURSTON on this journey of nearly three weeks duration is here published for the first time. J.K.W.

Witte, (Baron) Jehan de. Un explorateur et un apôtre du Congo français. Monseigneur AUGOUARD, archevêque titulaire de Cassiopée, vicaire apostolique du Congo français. Sa vie, ses notes de voyage et sa correspondance. Introduction par S. G. Monseigneur LE ROY, archevêque de Carie, supérieur général des Pères du Saint-Esprit. x+372 p., 71 phot. h. t., 1 pl., carte col. de l'Afrique Equatoriale française. Paris, EMILE-PAUL frères, 1924. ISIS

PROSPER AUGOUARD's African career began in 1877. G. S.

D. — *Medical sciences.*

Bast, Theodore H. The life and time of ADOLF KUSSMAUL (1822-1902). *Annals of Medical History*, 8, 95-127, 4 ill., 1926. ISIS

Burckhardt, Rudolf. Arzt und Menschenfreund. Der St. Galler Doktor JAKOB LAURENZ SONDEREGGER (1825-1896). 230 S. St. Gallen, Evangelische Gesellschaft, 1925. ISIS

Curschmann, Fritz; Curschmann, Hans; Hirsch, Carl; and Wolff, Felix. Erinnerungen an HEINRICH CURSCHMANN (1846-). IV+88 S., 6 Taf. Berlin, JULIUS SPRINGER, 1926. ISIS

Cushing, Harvey. The life of Sir WILLIAM OSLER (1849-1919). 2 vol. XVI+685 p.; XII+728 p., many plates. New York, Oxford University Press, American Branch, 1925. ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 358-361, 1926.

Finot, A. Un étudiant en médecine pendant la seconde république. *Bul. Soc. Franç. Hist. Méd.*, 20, 258-270, 1926. ISIS

EUGÈNE AUDIGÉ, médecin dans un village de l'Yonne de 1851 à 1899; grand père maternel de l'auteur. G. S.

Fox, George Henry. Reminiscences. New York, Medical Life Press, 1926. ISIS

Recollections of an American dermatologist.

Gelderen, D. N. van. De inrichting voor ziekenverpleging te Middelburg van 1859-1879. *Bijdragen tot de geschied. der geneeskunde*, 6, 213-232, 1926. ISIS

Johnson, Charles Beneulyn. Sixty years in medical harness. New York, Medical Life Press, 1926. ISIS

Le Gendre, Paul. Notice nécrologique sur ERNEST DESNOS (Paris, 1853 — Pondichéry, 1925). *Bull. Acad. Médecine*, nº 41, 1178-1185, 1925. ISIS

Parisian urologist, editor of the Encyclopédie française d'urologie, to which he contributed a very interesting historical introduction (1914, *Isis*, 2, 466). G. S.

Marquardt, Martha. PAUL EHRLICH (1854-1915) als Mensch und Arbeiter. Erinnerungen aus dreizehn Jahren seines Lebens (1902-1915). Mit einer Einführung von RICHARD KOCH. 112 S., 4 Bildnissen und zwei Faksimiles. Stuttgart, Deutsche Verlagsanstalt, 1924. ISIS

Reviewed by ERNST BLOCH, *Isis*, 8, 189-191, 1926.

(Osler, Sir William). Sir WILLIAM OSLER-Memorial number. Appreciations and reminiscences. Bulletin No. 9 of the International Association of Medical Museums. xxxviii+633 p., 103 illus. Montreal, 1926.

Reviewed by KARL SUDHOFF, *Mitt. zur Geschichte der Medizin*, 256-257, 1926.

E. — *Alia.*

Heere, W. R. FRÉDERIC LE PLAY en zijne volgelingen ; de methode der monographieën. 238 blz., gr. 8º, 1 pl. P. NOORDHOFF, Groningen, 1926. ISIS

Copieuse étude consacrée à PIERRE GUILLAUME FRÉDÉRIC LE PLAY (La Rivière St. Sauveur, Calvados, 1806, 04, 11 — Paris, 1882, 04, 05), ingénieur des mines devenu sociologue par ses observations des ouvriers et des paysans du Harz, d'Angleterre, de Russie. Son ouvrage sur *les ouvriers européens*, 6 vol. 1855, inaugure la méthode des travaux économiques basés sur de vastes monographies de familles ouvrières, et lui vaut immédiatement des disciples qui se groupent autour de lui dans la « Société internationale des études pratiques d'économie sociale » (1856). En 1864, il publie *la Réforme sociale en France*, déduite de l'observation comparée des peuples.

En 1872, il fonde les « unions de la paix sociale » qu'il dote, en 1881 d'un important organe, *la Réforme sociale* auquel il pensait depuis 1865. La même année 1881, il résume son œuvre qui est toute, croit-il, de paix sociale, de subordination des intérêts à la morale, dans sa *Constitution essentielle de l'humanité*. — Parmi les disciples de LE PLAY, l'auteur consacre un chapitre à HENRI DE TOURVILLE (1842, 03, 19 — 1903, 03, 05), un autre à EDMOND DEMOLINS (1852-), et parle plus incidemment de CLAUDIO JANET, CH. DE RIBBE, AD. FOCILLON, LÉON GUÉRIN, PAUL BUREAU, PAUL DESCAMPS, F. BUTEL, etc. L. G.

Parry, Reginald St. John. HENRY JACKSON, O. M., Vice-Master of Trinity College and Regius Professor of Greek in the University of Cambridge. A memoir. Cambridge University Press, 1925. ISIS

Pruette, Lorine. G. STANLEY HALL. A biography of a mind. With an introduction by CARL VAN DOREN. XIII+267 p. New York, APPLETON, 1926. ISIS

(Seler, Eduard). Verzeichnis der Schriften von EDUARD SELER bearbeitet von WALTER LEHMANN. Festschrift EDUARD SELER, dargebracht zum 70. Geburtstag von Freunden, Schülern und Verehrern, herausgegeben von WALTER LEHMANN. p. 3-26. Stuttgart, STRECKER und SCHRÖDER, 1922. ISIS

List, with name and subject index, of 257 publications, primarily on Mexican archeology and ethnology. J. K. W.

XXth Century.

B. — *Physical sciences and technology.*

Lorentz, Hendrik Antoon. MAX PLANCK und die Quantentheorie. *Die Naturwissenschaften*, 13, 1077-1082, 1925. ISIS

Thomas, Lowell. The first world flight : being the personal narratives of LOWELL SMITH, ERIK NELSON, LEIGH WADE, LESLIE ARNOLD, HENRY OGDEN, JOHN HARDING. Boston, HOUGHTON MIFFLIN, 1925. ISIS

D. — *Medical sciences.*

Bizard, Léon. Souvenirs d'un médecin des prisons de Paris. 240 p., ill. Paris, GRASSET, 1925. ISIS

Comrie, John D. ARTHUR ROBERTSON CUSHNY. *Medical Life*, 33, 245-248, 1926. ISIS

Scotch pharmacologist, died 1926 Ae. 60. Article followed by a chronology of Digitalis. Portrait. G. S.

Kahn, Max (1887-1926). Whole number of *Medical Life*, 33, 333-390, 1926, devoted to him. ISIS

Contains posthumous articles, biography, portraits, bibliography, appreciations of his life and work by various writers. MAX KAHN was born in Russia, he came to the U. S. in 1897; got his M. D. at Cornell in 1910. His special studies were the application of biochemistry to medicine; he will be chiefly remembered because of his work on Intarvin. He was deeply interested in medical history and wrote a number of papers on the subject. He was director of laboratories of the Beth Israel hospital of New York and visiting physician of the United Israel-Zion hospital of Brooklyn. He was to have been the president of the medical board and the leading spirit of the New Beth Israel hospital. A book of his on sulfur metabolism was in the press at the time of his untimely death. G. S.

(Pôrto, Portugal). O instituto de anatomia. Sumula dos trabalhos de investigação (1911-1925). (I Centenario da Faculdade de Medicina do Pôrto, 1825-1925). Pôrto, Enciclopédia Portuguesa, 1925. ISIS

Summary of the anatomical work done from 1911 to 1925 followed by a bibliography of no less than 130 titles. This proves that the anatomical institute of the University of Porto is extremely active. G. S.

E. — *Alia.*

Deutsches Biographisches Jahrbuch. Hrsg. vom Verbande der Deutschen Akademien. Ueberleitungsband I : 1914-1916. 372 S. Stuttgart, Berlin und Leipzig, Deutsche Verlagsanstalt, 1925. ISIS

PART II.

HISTORICAL CLASSIFICATION.

Including only the items which could not be included in Part I — the fundamental (centurial) classification. Hence a student of Muslim science, for example, should not peruse simply the notes collected below under the heading « Islam », he should examine as well those included above under the headings VIIth century, VIII century, etc.

CONTENTS :

I. — *Antiquity* : 1. Antiquity (generalities) ; 2. Egypt ; 3. Babylonia and Assyria ; 4. Greece ; 5. Rome.

II. — *Middle Ages* : 6. Middle Ages (generalities) ; 7. Byzantium.

III. — *Oriental Science and Civilization* : 8. Asia (generalities; Western Asia ; Central Asia ; Eastern Asia) ; 9. India ; 10. China ; 11. Japan ; 12. Israel ; 13. Iran ; 14. Islam.

I. — ANTIQUITY.

1. — ANTIQUITY (GENERALITIES).

Arnim, Johann von. Stoicorum veterum fragmenta. Vol. IV quo indices continentur conscr. MAXIMILIANUS ADLER. VIII+221 S. Leipzig, TEUBNER, 1924. ISIS

Reviewed by JOH. MEWALDT, *Deutsche Literaturzeitung*, 1687-1689, 1926.

Friend, J. Newton. Iron in antiquity. VIII+221 p. London, CHARLES GRIFFIN, 1926. ISIS

Friend, J. Newton. Iron in antiquity. Substance of a lecture delivered at the Royal Institution on June 3. *Nature*, 117, 862, 1926. ISIS

Regnault, Félix. Les ex-voto polysplanchniques de l'antiquité. *Bul. Soc. Franç. Hist. Méd.*, 20, 135-150, 1926. ISIS

Schiaparelli, Giovanni. Scritti sulla storia della astronomia antica. P. 1a, scritti editi, t. 2, 400 p., NICOLA ZANICHELLI, Bologna, 1926. ISIS

Avec ce volume, dû comme le t. I aux soins éclairés de LUIGI GABBA (*Isis*, 8, 503-6), se trouve achevé le groupement des travaux déjà édités de SCHIAPARELLI sur l'histoire de l'astronomie ancienne. On y trouvera : (pp. 5-112) Le sfere omocentriche di EUDOSSO, di CALIPPO e di ARISTOTELE (mémoire de 1874, imprimé en 1877); (p. 113-177) Origine del sistema planetario eliocentrico pressi i Greci (1898); (p. 178-234) Rubra canicula; considerazione sulla mutazione di colore che si dice avvenuta in Sirio (1896-7; la présente édition de ce mémoire, en deux parties, diffère de l'édition première par des additions faites par SCHIAPARELLI à son MS. en vue d'une édition ultérieure); (p. 235-285) Sui parapegmi o calendari astro-meteorologici degli antichi (1892; même remarque que pour le mémoire précédent). — Suivent en appendice des notes moins importantes : Cenno dei recenti studi del Dr. CANTOR sulla storia dell' agrimensura (1876); sulla nuova storia delle matematiche pubblicata dal Prof. M. CANTOR (1881); a proposito di un nuovo trattato di cronologia astronomica (1907); il s'agit du Handbuch der mathematischen Chronologie, de F. K. GINZEL); a proposito di una storia dei sistemi planetari da TALETE a KEPLERO (1908; cette histoire est celle de J. L. E. DREYER); ALBATENIO (1904; à propos du mémoire de C. A. NALLINO sur AL-BATTANI); studi greco-indiani del prof. M. CANTOR di Heidelberg, tradotti in Italiano sul manoscritto da G. SCHIAPARELLI (1876). — Au moment où je rédige cette note, L. GABBA m'annonce que le t. III, qui donnera les inédits de SCHIAPARELLI, est en bonne voie d'impression.

L. G.

Schmidt, Alfred. Drogen und Drogenhandel im Altertum. VIII+136 S. Leipzig, JOHANN AMBR. BARTH, 1924. ISIS

Reviewed by JULIUS RUSKA, *Isis*, 8, 192, 1926; 7, 252.

Schultz, Wolfgang. Zeitrechnung und Weltordnung in ihren übereinstimmenden Grundlagen bei den Indern, Iraniern, Hellenen,

Italikern, Germanen, Kelten, Litauern, Slawen. Mit 75 Abb. in Text. (*Mannusbibliothek*, herausgeg. von GUSTAF KOSINNA, Band 35). VII+289 S. Leipzig, CURT KABITSCH, 1924. ISIS

Reviewed by JULIUS RUSKA, *Isis*, 8, 193-195, 1926.

Torrey, Charles C. The Akhîrâm inscription of Byblos. *Journal American Oriental Society*, 45, 269-279, 1925. ISIS

A discussion of a Phœnician royal inscription discovered in 1923 in the exploration of a series of tombs during the French excavations at Byblos. Halfway down the shaft of one of the tombs were half a dozen words, cut in the wall in archaic Phœnician characters; and on the sarcophagus were two lines. There have been two previous attempts at translation and commentary. The date is the time of RAMESES II, — the 13th century B. C.; the inscription thus antedates by some 400 years the oldest previously known writing in the N. Semitic alphabet. The dialect is essentially the classical Phœnician. There appears to be evidence of Assyrian influence in both the vocabulary and the contents of the documents. J. S.

Werner, Hans. Antike Ohranatomie und Gehörsphysiologie. *Archiv für Geschichte der Medizin*, 18, 151-171, 1926. ISIS

2. — EGYPT.

Borchardt, Ludwig. Längen und Richtungen der vier Grundkanten der grossen Pyramide bei Gise. Mit Bemerkungen über die Besucherinschriften an der Pyramide v. EUGEN MITTWOCH und ERNST SITTIG. 21 S. Berlin, SPRINGER, 1926. ISIS

Budge, Sir E. A. Wallis. The dwellers on the Nile. Chapters on the life, history, religion and literature of the ancient Egyptians. XXXII+326 p., 11 pl. London, Religious Tract Society, 1926. ISIS

Erman, Adolf. Die ägyptischen Schülerhandschriften. *Abhdl. der Preussischen Akademie der Wissenschaften*, 1925, 2. 32 p. Berlin, 1925. ISIS

Hasan, Kamal. Ancient Egyptian medicine (aṭ-ṭibb al-miṣrî alqadîm). (In Arabic). 297 p. Cairo, 1922. ISIS

Reviewed by MAX MEYERHOF, *Isis*, 8, 198-200, 1926.

Morgan, Jacques de. Observations sur la chronologie égyptienne dite « réduite». *Revue archéologique*, 17, 243-254, 1923. ISIS

Naville, Edouard. L'âge du cuivre en Egypte. *Revue archéologique*, 20, 1-20, 1924. ISIS

« L'âge du cuivre est-il plus ancien en Babylonie qu'en Egypte? C'est là une question fort discutée, mais il semble bien que les découvertes récentes montrent que la civilisation est plus ancienne en Mésopotamie que dans la vallée du Nil. Les Sumériens qui les premiers l'ont occupée venaient-ils aussi de l'Arabie? Etaient ils aussi Chamites comme les Egyptiens? Nous ne prétendons pas émettre une opinion sur ces questions redoutables. Tout

ce que nous croyons pouvoir affirmer, c'est que la civilisation égyptienne est une civilisation chamitique, apportée à la population néolithique de la vallée du Nil par des Chamites de même race, partis du sud de l'Arabie, et qui connaissaient l'usage du métal, lequel était le cuivre. »

Neugebauer, O. Die Grundlagen der ägyptischen Bruchrechnung. VI+45 S. 5 Tfln, Berlin, SPRINGER, 1926. ISIS

Eine ganz vorzügliche Arbeit, was das rein Sachliche der ägyptischen Bruchzerlegung und Bruchrechnung betrifft. In der Auffassung der ägyptischen Leistung weiche ich allerdings vom Verf. etwas ab, wie meine Arbeiten (*Isis*, 9, 11-28) schon gezeigt haben. Ich glaube doch, dass die Aegypter etwas mehr bei der Sache gedacht haben, als der Verf. mit K. SETHE, dessen Suggestion er stark unterlag, annimmt. Auch sollte man nach meiner Meinung auf dieser Stufe der Entwicklung unter « Wissenschaft » nicht « systematische Wissenschaft » verstehen. Für die Kunst erkennt Verf. eine ähnliche Umstellung des Urteils ausdrücklich an (S. 16). H.W.

Rey, Abel. Coup d'œil sur la mathématique égyptienne. *Revue de Synthèse Historique*, 41, 19-62, 1926. ISIS

Apropos of ERIC PEET's edition of the Rhind papyrus. London 1923, analysed in *Isis*, 6, 553-557, 1924. G. S.

Sethe, Kurt. Das Verhältnis zwischen Demotisch und Koptisch und seine Lehren für die Geschichte der ägyptischen Sprache. *Zeit. d. deutsch. morgenl. Ges.*, N. F., 4, 290-316, 1925. ISIS

A discussion of the relations between later Egyptian, Demotic, and Coptic, and of the development of the two latter out of the former. J. S.

Sethe, Kurt. Die wissenschaftliche Bedeutung der Petrie'schen Sinaifunde und die angeblichen Moseszeugnisse. *Zeit. d. deutsch. morgenl. Ges.*, N. F., 5, 24-54, 1926. ISIS

In the winter of 1904-1905 the Egyptian Exploration Fund Expedition, led by FLINDERS PETRIE, discovered in the Sinai Peninsula, in the ruins of a temple near the malachite mines of Serabît el-chadem three sculptures of evidently foreign origin, with inscriptions, and also other inscriptions on the rock in a neighboring valley. These were in a new script, which appeared to be a barbaric imitation of Egyptian hieroglyphics, and which was interpreted by GARDINER as the earliest form of the Phœnician alphabet. The date of the temple is put at the end of the 12th dynasty of the Middle Kingdom, about the latter half of the 19th century B. C.; the inscriptions are somewhat later, but before 1600 B. C. The inscriptions do indeed form the missing link between the Egyptian and Semitic scripts, from the latter of which all the alphabets of the world are derived, directly or indirectly; this parent form is here found near the actual site of its origin, whence it could easily spread both north (Phœnician) and south (Sabæan or South Semitic). J. S.

3. — BABYLONIA AND ASSYRIA.

Albright, W. F. A Babylonian geographical treatise on SARGON of Akkad's Empire. *Journal of the American Oriental Society*, 45, 193-245, map, 1925. ISIS

A study of « the most interesting cuneiform geographical text yet discovered, published recently by SCHROEDER as N° 92 of his Keilschrifttexte aus Assur verschiedenen Inhalts (Leipzig, 1920). » The elucidation of the topography is very difficult and puzzling; the text is very corrupt in places, though not difficult from a purely philological point of view. The transcription of the text occupies a page and a half; the rest of the paper is commentary. The text is a fragment only; in its first two lines is contained a list of countries whose kings were conquered by SARGON, while the main portion of the fragment locates districts and countries mentioned in the SARGON inscriptions by giving their extreme boundaries.

The origin of the text is thus conceived by the author : — The inscriptions of Sargon and Narâm-Sîn were copied and recopied during the third millennium; in the process glosses and errors naturally crept in. Meanwhile the Sargon cycle of romances developed and enjoyed a wide popularity, which led to the writing down of such epics as *shar tamkhari*, where popular legend was embellished with learned citations from the corpus of Sargon texts. Finally there arose elaborate commentaries on this literature, one of which we have before us; it is to be referred to the same circles of erudite productivity as those which are familiar to us from the Nippur discoveries, and its first compilation is to be dated roughly in the Isin dynasty, between 2300 and 2100, according to FOTHERINGHAM's chronology. J. S.

Budge, Sir E. A. Wallis. The rise and progress of Assyriology. 308 p., 32 pl. London, MARTIN HOPKINSON, 1925. ISIS

This most interesting account by one of the living leaders of Assyriological studies is completed by a large collection of portraits. The main works of each scholar are quoted. The last chapters contain some bitter remarks on German Assyriologists. Contents : I. The antiquities in Persia : Takht-i-Jamshîd (Persepolis), Murghâb (Pasargadæ), Naqsh-i-Rustam, Bihistûn (Bagistân); II. Early travellers in Persia, The Rock of Bihistûn; III. The first attempts to decipher the Persian cuneiform inscriptions; IV. H. C. RAWLINSON's decipherment of the Persian inscriptions; V. RAWLINSON's « Memoir » on the Persian version; VI. The Susian version of the Bihistûn inscription; VII. Early travellers in Babylonia and Assyria; VIII. RAWLINSON and the Babylonian version of the Bihistûn inscription; IX. RAWLINSON as director of excavations in Mesopotamia; X. RAWLINSON and the publication of cuneiform texts; XI. The renewal of excavations by the British Museum; XII. The cleaning and repair of inscribed tablets; XIII. The catalogue of the Quyûnjiq collection; XIV. The publication of « Cuneiform texts »; XV. Some other English assyriologists; XVI. The spread of Assyriology : in France, in Switzerland, in Germany, in Italy, in Scandinavia, Finland, etc., in Holland, in America; XVII. The passing of the Society of Biblical Archæology; XVIII. Miscellaneous observations; Bibliography; Index. G. S.

Eisler, Robert. L'origine babylonienne de l'alchimie. A propos de la découverte récente de recettes chimiques sur tablettes cunéiformes. Traduit de l'allemand par ROBERT BOUVIER. *Revue de Synthèse Historique*, 41, 5-17, 1926. ISIS

Apropos of the works of H. ZIMMERN. Assyrische chemisch-technische Rezepte. *Z. F. Assyriologie*, 1925, and of R. CAMPBELL THOMPSON. On the chemistry of the ancient Assyrians. London, 1925 (*Isis*, 8, 583). G. S.

Karpinski, L. C. New light on Babylonian mathematics. *American Mathematical Monthly*, 33, 325-326, 1926. ISIS

Apropos of BRUNO MEISSNER, Babylonien und Assyrien, 1920-1924, which was reviewed in *Isis*, 8, 195-198.

Meissner, Bruno. Babylonien und Assyrien. Erster Band. Mit 138 Text-Abb., 223 Tafel-Abb. und einer Karte. VIII+466 S. ; Zweiter Band. Mit 46 Text-Abb., 55 Tafel-Abb. und 2 Karten. VIII+493 S. Heidelberg, CARL WINTER, 1920-1924. ISIS

Reviewed by JULIUS RUSKA, *Isis*, 8, 195-198, 1926; 5, 265.

Meissner, B. Ein neubabylonisches Zuckungsbuch. *Sitzungsberichte der Preussischen Akademie*, 1921, p. 319-24. ISIS

« In letzter Zeit hat nun LUTZ im AJSL. XXXV, 145 ff. einen umfangreichen Omentext publiziert, den er fälschlich als « referring to the action of a dreamer » ansieht. Er ist aber nichts anderes als ein Zuckungsbuch, das auf 86 Zeilen alle möglichen (unwillkürlichen) Bewegungen des menschlichen Körpers aufzählt und daraus Schlüsse auf die Zukunft zieht. Der text ist neubabylonisch geschrieben, stammt also frühestens etwa aus Nebukadnezars Zeit, könnte aber auch wesentlich jünger sein. »

Müller, Reiner. Die Sagalla-und die Kabartukrankheit der Keilschriften, Filaria medinensis und Mycetoma pedis. *Archiv für Geschichte der Medizin*, 18, 189-192, 1926. ISIS

Schoch, C. Ammizaduga. 12 p. Kuhligkshof 5, Berlin-Steglitz, Selbstverlag, 1925. ISIS

Schoch, C. Die erste Dynastie Babylon's. *Klio*, 20, 107-109, 1926. ISIS

Supersedes the article Ammizaduga by same author.

Schoch, C. The « Arcus Visionis » in the Babylonian observations, with tables of the Babylonian calendar. 11 p. Oxford, University Observatory, 1924. ISIS

Schoch, C. The « Arcus Visionis » of the planets in the Babylonian observations. *Monthly Notices of R. A. S.*, Supp., 731-734, 1924. ISIS

Thompson, Reginald Campbell. The Assyrian herbal. A monograph on the Assyrian vegetable drugs, the subject matter of which was communicated in a paper to the Royal Society, March 20, 1924. XXVII+294 p. London, LUZAC, 1924. ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 506-508, 1926.

4. — GREECE.

Boisacq, Emile. *a*) Le nom de la mer Noire en grec ancien. *Rev. belge de philologie et d'histoire*, 1924, p. 315-317 ; *b*) Sur l'étymologie du nom ancien de la mer Noire. *Rev. Archéologique*, I, p. 401-402, 1924. ISIS

ἄξεινος, Iranian root meaning dark colored.

Cary, M. The Greeks and the ancient trade with the Atlantic. *Journal of Hellenic Studies*, 44, 166-179, 1924. ISIS

Croiset, Maurice. Hellenic civilization : an historical survey. x+318 p. New York, A. A. KNOPF, 1926. ISIS

French edition, Paris 1922.

Enriques, Federigo. Il problema della forma della terra nell'antica Grecia. *Periodico delle Matematiche*, 6, 73-98, 1926. ISIS

Glotz, Gustave. Ancient Greece at work : an economic history of Greece from the Homeric period to the Roman conquest. Translated by M. R. DOBIE. (The history of civilization series). XII+ 402 p. New York, ALFRED A. KNOPF, 1926. ISIS

Hallo, R. Uber die griechischen Zahlbuchstaben und ihre Verbreitung. *Zeit. d. deutsch. morgenl. Ges.*, N. F., vol. 5, 55-67, 1926. ISIS

The use of letters to denote numbers was current in Greek, where it existed among the Milesians in B. C. 450; the significance of the letters was a consequence of their order; $\delta = 4$, and $\iota = 10$, because δ was the fourth and ι the tenth letter. This use of letters was taken over by other peoples, but in different ways; e. g., the Jews took the principle, while the Arabs adopted the Greek system mechanically the value of their *d* and *i* was still 4 and 10 respectively, though *d* is the eighth and *i* the twenty-eighth letter of their alphabet. J. S.

Junge, Gustav. Wann haben die Griechen das Irrationale entdeckt. Novae symbolae Joachimicae, 44 S. Halle a S., 1907. ISIS

Conclusion : it is impossible to say. The early history of surds is mythical. G. S

Junge, Gustav. Besonderheiten der griechischen Mathematik. *Jahresbericht der deutschen Mathematiker-Vereinigung*, 35, 66-80, 150-172, 1926. ISIS

I. Unsere Kenntnis der älteren griechischen Mathematik : Die regulären Körper. PYTHAGORAS und die Pythagoreer. EUDEMUS. Die erhaltenen Schriften. Die mathematischen Probleme der klassischen Zeit. PLATO. Das Irrationale. Das Ziel der Elemente EUKLIDS. II. Die Exhaustion.

Liddell, Henry George and **Scott, Robert.** A Greek-English lexicon. A new edition revised and augmented throughout by HENRY STUART JONES. Part 2 : ἀποβάλλω — διαλέγω p. 193 to 400 Oxford, Clarendon Press, 1926 (New York, Oxford University Press). ISIS

I devoted a long review in *Isis*, VIII, 200-2, to this monumental publication when the first part appeared in 1925. I am glad to be already able to announce the appearance of the second part which takes us now down to the middle of delta, and I hope that the following parts will follow as promptly as possible. This second part includes a sheet of addenda and corrigenda; this is of course welcome though it is hoped that the necessity for such

appendixes which are very seldom used will be reduced to its strict minimum. This is not simply a monument of learning, it is also a model of compact yet very legible and beautiful printing. G. S.

Rohde, Erwin (1845-1898). Psyche : the cult of souls and belief in immortality among the Greeks. Translated from the eighth edition by W. B. HILLIS. (International Library of Psychology, Philosophy and Scientific Method). XVI+626 p. New York, HARCOURT, BRACE, 1925. ISIS

First German edition, 1894 (1890-93).

Sudhoff, Karl. Handanlegung des Heilgottes auf attischen Weihetafeln. *Archiv für Geschichte der Medizin*, 18, 235-250, 4 pl., 1926. ISIS

5. — ROME.

Rostovtsev, Mikail Ivanovich. The social and economic history of the Roman empire. XXV+695 p., plates, plans, and illustrations. Oxford, Clarendon Press, 1926. ISIS

Sloley, R. W. The groma : an ancient surveying instrument. *Nature*, 118, August 28, 1926. ISIS

Apropos of a portion of such instrument found in the surplusage of the Museum of the Egypt Exploration Society; it has been acquired by the South Kensington Museum. G. S.

II. MIDDLE AGES

6. — MIDDLE AGES

Generalities.

Adams, George Burton. Councils and courts in Anglo-Norman England. XXV+403 p. New Haven, Yale University Press, 1926. ISIS

Cellé, Anna. L'assainissement de la campagne romaine au moyen-âge par les religieux français. *Bull. Acad. Médecine*, nº 36, 997-1000, 1925. ISIS

Cranage, David Herbert Somerset. The home of the monk. An account of English monastic life and buildings in the Middle Ages. XII+124 p., 20 plates and 4 plans. Cambridge, University Press, 1926. ISIS

Ellis, T. P. Welsh tribal law and custom in the Middle Ages. 2 vol. XIV+456 p. ; VI+460 p., maps. Oxford, Clarendon Press, 1926. ISIS

Contents : 1. The social structure; 2. The land; 3. Renders and services; 4. The law of persons; 5. The law of civil obligations; 6. The law of crimes and torts; 7. The courts and judiciary; 8. Pre-curial survivals; 9. The law of procedure; 10. Appendices I to XIII. Glossary of Welsh terms. Index. Maps. « The pages that follow contain an attempt at explaining the social and legal system under which the Welsh people lived in the last three or four centuries of indigenous rule. (c. 900-1300). »

Galbraith, G. R. The constitution of the Dominican Order, 1216 to 1360. XVI+286 p. Manchester, University Press, 1925. ISIS

Iorga, Nicolae. Points de vue sur l'histoire du commerce de l'Orient au moyen-âge. 110 p. Paris, GAMBER, 1924. ISIS

Jeanselme, Edouard. La lèpre en France au moyen-âge. *Revue de technique médicale*, nº 42, 985-993, 1925. ISIS

Lot, Ferdinand. Mélanges d'histoire du moyen-âge offerts à M. FERDINAND LOT par ses amis et ses élèves. XLI+740 p. Paris, H. CHAMPION, 1925. ISIS

Reviewed by CHARLES H. HASKINS, *Speculum*, 1, 352-353, 1926.

Newton, Arthur Percival (*editor*). Travel and travellers of the Middle Ages. (The history of civilization series). VIII+223 p., 7 pl., map and facsimile. London, KEGAN PAUL, 1926. ISIS

Rand, Edward Kennard. Mediaeval gloom and mediaeval uniformity. *Speculum*, 1, 253-268, 1926. ISIS

Rossini, Carlo Conti. Leggende geografiche giudaiche del IX secolo (il Sefer ELDAD). *Bollettino della Reale Società Geografica Italiana*, ser. 6, vol. 2, 160-190, 1925. ISIS

The Sefer ELDAD or Book of ELDAD the Danite has been well known to Rabbinical scholars since the Middle Ages. Purporting to be the work of an enigmatical Jewish traveller of the latter part of the ninth century, it « describes the status of the tribes of Israel which had migrated to the land of Cush, the voyage of Eldad from Cush to Persia, the homes of the remaining Israelites, and in conclusion the genealogy of ELDAD ». The present article is a scholarly discussion of the probable identity of ELDAD and of the origins of the book. The latter is also for the first time here shown to have been extensively used by the author of the original redaction of the famous Letter of PRESTER JOHN dating from the twelfth century. J. K. W.

Rougier, Louis. La scolastique et le thomisme. XLIV+812 p. Paris, GAUTHIER-VILLARS, 1925. ISIS

Reviewed by L. GUINET, *Isis*, 8, 219-221, 1926.

7. — BYZANTIUM.

Höeg, Carsten. La théorie de la musique byzantine. *Revue des Etudes grecques*, 35, 321-335, 1922. ISIS

Marguliés, A. Bulgarien und Byzanz in ihren kulturellen Beziehungen. *Zeit. d. deutsch. morgenl. Ges.*, N. F., 5, 172-188, 1926. ISIS

The influence of the Byzantine Empire on the Bulgars is shown in the Church literature of the latter people; in their art, especially their architecture and painting; and in a number of loan-words, such as certain of those related to court life, ceremonial, and titles. On the other hand, the Byzantines borrowed the names of a number of common things, and certain terms relating to ordinary daily life. J. S.

III. — ORIENTAL SCIENCE AND CIVILIZATION.

8. — ASIA.

Central Asia.

Charpentier, Jarl. The original Home of the Indo-Europeans. *Bull. School Oriental Studies*, 4, 147-170, London, 1926. ISIS

The author's arguments are drawn — as all used in similar discussions must be — from the common vocabulary of the Indo-Europeans; and the conclusion arrived at is one that, as he admits, is now looked on with suspicion and disapproval by most comparative philologists. « The home of the tribes who once spoke the Indo-European language is to be looked for in, and in the neighbourhood of Central Asia »; more particularly, in the regions to the East of the Caspian Sea, with the neighbouring plains of Turkestan. The Indo-Iranians moved south probably about 2400-2300 B. C., and the Indian branch entered India 2000 B. C. or one or two centuries later. The migration to the west also started about 2000 B. C. The origin of both movements was probably the same, — pressure from the nomadic populations of Upper Asia. J. S.

Hedin, Sven. Den buddhistiska senantiken i mellersta Asien. *Ymer*, 44, 361-368, 1924. ISIS

Karo, G. Die Kunst von Ost-Turkistan. *Zeit. d. deutsch. morgenl. Gesch.*, N. F., 4, 136-149, 1925. ISIS

Eastern Turkestan is a desert land of plateaux and mountain chains, crossed from of old by caravan routes, with the cities of Kashgar, Yarkand, and Tashkent on its western borders. The material collected by the explorers LE COQ and GRÜNWEDEL has been set forth in LE COQ's Chotscho (Berlin 1913), and Die Ergebnisse der königl. Preuss. Turfan-Expedition : Die Buddhistische Spätantike im Mittelalter (Berlin, 1923-1924); and in GRÜNWEDEL's Altbuddhistischen Kultstätten in Chinesisch-Turkistan, (Berlin, 1912) and Alt-Kutscha (Berlin, 1920); Chotscho is the now mostly abandoned chief town of the large oasis Turfan, and Kutscha one of the westerly cities of the region. The present article gives an outline of the chief results set forth in the above works. J. S.

Pelliot, Paul. Indian influences in the early Chinese art in Tun-Huang. *Indian Art and Letters*, 2, 21-28, 1926. ISIS

Eastern Asia.

(Including works relative to the whole of Buddhist Asia, or to India, Central and Eastern Asia, combined).

Rūs, Mary A. The cultural value of the ancient monuments in Java. *Indian Antiquary*, 54, 227-236, 1925. ISIS

A translation into English of a discussion on the above subject, by Dr. T. D. K. Bosch, Mr. N. A. van Leeuwen, Dr. Radjiman, and Mr. Maclaine Pont, which took place at the congress of the Java Institute held at Jogjakarta in December 1924. J. S.

Vajirañâna National Library, Bangkok. Publications in the Siamese language, sold by Luzac and Co., London. ISIS

The catalogue of these publications is very interesting. They are already very numerous and cover a very wide field. Most of them have been prefaced by H. R. H. Prince Damrong Rajanubhab. The following call for special mention : Series entitled Manners and Customs (3. Rice planting; 4. Siamese medical profession; 5. The aborigines of Siam). Dhananjai Chieng Mieng, the Siamese Eulenspiegel according to the version current in the Northern provinces. Treatise on growing fruit-trees and on planting rice. A treatise on the medical property of various herbs. Treatise on fever, by Phya Chandapuri (Klom). An ancient treatise on horses (2nd edition). A treatise on kite-flying. A collection of chronicles (31 vol.) Pâli Tripitaka, New complete edition, in about 40 volumes, 3 volumes already published. List of the Pâli and Sanskrit books and manuscripts in the Vajirañâna National Library. The Jâtaka, or Stories of the Buddha's former births, translated from the Pâli into Siamese. Fragments of the Siamese Râmâyana. Milindapañhâ, a fragment of an ancient translation of the questions of King Menander into Siamese. Finally I may still quote a Siamese translation of J. H. Breastead's excellent textbook Ancient Times. G. S.

9. — INDIA.

Altekar, Anant Sadasiv. A history of important ancient towns and cities in Gujarat and Kathiawad. *Indian Antiquary*, Suppl. to vol. 54, 1925. ISIS

An alphabetical list, with their modern identifications, and notes on their history. A chapter is added on the general features of city life in ancient Gujarat. J. S.

Banerjee, Jitendra Nath. The representation of Surya in Brahmanical art. *Indian Antiquary*, 54, 161-171, 2 pl., 1925. ISIS

Suriya is the sun-god, the most concrete of the solar deities, directly connected with the visible luminous orb. In ancient Indian art he was represented by various symbols such as the spoked wheel, rayed disc, lotus flower, etc.; later he came to be represented anthropomorphically. The characters, included dress, of the images are discussed. The prototype of these images was of foreign origin, probably the Greek Apollo figured on the coins of the Hellenistic kings of India, and was introduced into India in the early centuries of the Christian era; it was largely Indianized by the genius of Indian artists, and may have played a prominent part in the development of the type of many other important Brahmanical divinities. J. S.

Barret, Le Roy C. The contents of the Kashmirian Atharva-Veda, Books 1-12. *Journal of the American Oriental Society*, 46, 8-14, 1926. ISIS

A preliminary description of the contents of the above, — about half of the A. V. in the Kashmirian recension, which shows considerable agreement with, but also marked differences from the vulgate recension, and comprises all that has so far been published. The themes of the hymns are classified into groups, of which the following are of interest here : — (1) Charms to cure diseases and possession by demons; these are numerous, and give a variegated picture of primitive medicine, where cures are wrought by symbollic practices or with amulets, many of which are vegetable; Atharvan charms against fever have attracted attention because of their rather full statements of symptoms; there are six hymns against worms, and 25 against poisons, particularly of snakes. (2) Charms pertaining to women; including love charms, charms to bring about successful conception, to procure conception of a male child, and to promote easy parturition, etc. Also may be mentioned charms to secure harmony, influence in the assembly, etc.; charms pertaining to royalty; charms to secure prosperity and freedom from danger; charms in expiation of sin and defilement; cosmogonic and theosophic hymns; ritualistic hymns; imprecation against demons, sorcerers, and enemies. J. S.

Coomaraswamy, Ananda. The Indian origin of the Buddha image. *Journal of the American Oriental Society*, 46, 165-170, 1926. ISIS

The author has found it necessary to abandon the commonly accepted theory of the Greek origin of the Buddha image. He believes that the Gandhâra and Mathurâ types of the image « were created locally about the same time, in response to a necessity created by the internal development of Buddhism common to both areas... and that the Mathurâ type is the main source of the Gupta and later development both in and beyond India ». J. S.

Crooke, William. Religion and folklore of northern India. Prepared for the press by R. E. ENTHOVEN. IV+472 p. London, Oxford University Press, 1926. ISIS

Reviewed in *Nature*, 118, 255-257, 1926. First published in 1894. It was reissued in 1896, and is now published posthumously in a third edition, but entirely rewritten.

Datta, Bibhutibhusan. A note on the Hindu-Arabic numerals. *The American Mathematical Monthly*, 33, 220-221, 1926. ISIS

« It seems safe to assume that the place value was well known in India in the fifth century A. D., and probably earlier ».

Dey, Nundolal. Geographical dictionary of ancient and mediaeval India. *Indian Antiquary*, Suppl. to vol. 54, 1925. ISIS

Continued from the previous volume.

Ghatak, Jyotischandra. Sarala and Devadâru. *Indian Antiquary* 54, 181-190, 1925. ISIS

Sarala and Devadâru are Sanskrit names of trees, the identification of which has given much difficulty; some writers have considered them as identical. They are however distinct; pharmacopoeias, and treatises on Ayurveda and

botany, give them as having widely different medicinal properties. The author concludes that Sarala is *Pinus longifolia*, and Devadâru *Cedrus libani deodar*. J. S.

Glasenapp, Helmuth von. Der Jainismus. Eine indische Erlösungsreligion. Nach den Quellen dargestellt. 505 S. 3 farbige, 28 schwarze Taf. Berlin, ALF HÄGER, 1925. ISIS

Hillebrandt. A. Zur vedischen Mythologie und Völkerbewegung. *Zeit. f. Indologie und Iranistik*, 3, 1-22, 1925. ISIS

Indian tribes brought their influence to bear in Mesopotamia in the middle of the second century B. C. J. S.

Journal of Ayurveda, or the Hindu system of medicine. Honorary Editor-in-Chief : (Mahamahopadhyaya Kaviraj) GANANATH SEN ; Managing Editor : (Vishagbhushan Kaviraj) A. C. BISHARAD. Vol. II, April, 1926, nº 10, p. 358-98. ISIS

I think it worth while to mention this journal in *Isis*, because it represents an interesting revival of ancient Hindu medicine, a good example of the use of the history of science for nationalistic purposes. The Ayurveda movement is a revolt not only against the intellectual domination of an alien race, but also against the highly artificial tendencies of our age, a return to simpler and more natural life, diet and therapy. The contributions are exclusively in English but include many Sanskrit quotations. G. S.

Kanhere, S. G. Some remarks on Indian music. *Bull. School Oriental Studies*, 4, 105-120, London, 1926. ISIS

There are two principal systems or schools of music in India — the Dravidian or Karnatic, in the south and east, which remains pure and unaffected by any foreign influence; and the Hindustani, in the north and west, which has gone through many phases, is chiefly dominated by Persian music, and so has lost its original purity to a certain extent. The present article is concerned with the Hindustani system. J. S.

Prasad, Ishwari. History of medieval India : from 647 A. D. to the Mughal Conquest. With a foreword by L. F. RUSHBROOK-WILLIAMS. XXXIX+602 p. Allahabad, Indian Press, 1926. ISIS

Ray Prafulla Chandra. A History of Hindu Chemistry From the Earliest Times to the Middle of the Sixteenth Century A. D. with Sanskrit Texts, Variants, Translation and Illustrations. Vol. II. Second Edition : Revised and Enlarged. CHUCKERVERTTY, CHATTERJEE & Co., Ltd. Calcutta, 1925, 17+XCVI+290+152+XXI pages, half leather, Rs 6/—. ISIS

The second edition of Vol. I. and the first edition of Vol. II, have been reviewed in *Isis*, 3, 68 (1920) by P. MASSON-OURSEL. Students of the history of chemistry will be glad that the publication of a second edition of volume two now makes both volumes available. The second edition appears to be revised in the sense that many typographical errors have been corrected, but it does not appear to be enlarged. It has the same pagination as the earlier edition, but contains two leaves less, for it lacks the « errata ».

The first volume of this classic has become indispensible to the teacher

of the history of chemistry, for it contains an account of many chemical processes, some of them suggestive of the Leyden papyrus, others similar to those of GEBER, LULLY, and ALBERTUS MAGNUS, and it contains much interesting material on the primitive technical arts of the Hindus. The second volume compares the various treatises, deals critically with the problem of dating them, and contains an account of the physical and chemical theories of the ancient Hindus and of Hindu methodology by BRAJENDRA NATH SEAL.

TENNEY L. DAVIS.

Schrader, F. Otto. Dravidisch und Uralisch. *Zeit. f. Indologie und Iranistik*, 3, 81-112, 1925. ISIS

The purpose of the article is to show that relationships exist between the Dravidian and the Ural families of speech, which merit fuller investigation. The statement that the Dravidian element of speech entered India from Australia is not true; but conclusions as to linguistic relationships are not forthwith to be translated into terms of racial wanderings. J. S.

Tachibana, S. The ethics of Buddhism. XII+288 p. London, Oxford University Press, 1926. ISIS

Tilak, Lokamanya Bâl Gangâdhar. The Arctic home in the Vedas. Being also a new key to the interpretation of many Vedic texts and legends. 24+502 p., 1 portrait in color. Tilak Bros., Gaikwar Wada, Poona city, 1925. ISIS

The author who ascribes an extreme antiquity to the Vedas (c. 4500 B. C.) has come to the conclusion that the Aryans originated in the arctic regions. He thus revived in a different way, the theory advocated by WM. F. WARREN (sometime President of Boston University !) in the Paradise found or the Cradle of the human race at the North Pole (1885). G. S.

10. — CHINA.

Carter, Thomas Francis (1882-1925). The invention of printing in China and its spread westwards. XVIII+282 p., 40 illustrations and charts. New York, Columbia University Press, 1925. ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 361-373, 1926.

Chen, K. K. and **Ling, Amy S. H.** Fragments of Chinese medical history. I. HUA TU (c. 115-205), Chinese surgeon ; II. PEN TSAO *Annals of Medical History*, 8, 185-191, 6 illustrations, 1 table, 1926. ISIS

Forke, Alfred. The world-conception of the Chinese. Their astronomical, cosmological and physico-philosophical speculations. XIV+300 p. London, PROBSTHAIN, 1925. ISIS

Reviewed by GEORGE SARTON. *Isis*, 8, 373-375, 1926.

Franke, O. Der Ursprung der chinesischen Geschichtschreibung. *Sitzungsberichte der Preussischen Akademie, Philol. Kl.*, 1925, p. 276-309. ISIS

« Die chinesische Geschichtschreibung, hervorgegangen aus kultisch-astrologischen Listen und Aufzeichnungen, aus partikularen Annalen und der Niederschrift mündlicher Überlieferungen, hat sich auch nur bis zu jener Linie der geistigen Freiheit erheben können, die dem gesamten chinesischen Denken durch seine universalistisch-konfuzianische Weltanschauung gezogen war. Gebunden in der Überlieferung, musste der chinesische ebenso wie der japanische Geschichtschreiber in den Niederungen formalistischer Gedankensphären stecken bleiben, zu den freien Höhen eines den ganzen psychischen Urgrund erfassenden geschichtlichen Erkennens vorzudringen, konnte ihm nicht vergönnt sein ».

Geil, William Edgar. The sacred 5 of China. Plates and illustrations. London, MURRAY, 1926. ISIS

Min, Wang Chi. China's contribution to medicine in the past. *Annals of Medical History*, 8, 192-201, 1926. ISIS

Read, Bernard E. Gleanings from old Chinese medicine. *Annals of Medical History*, 8, 16-19, 1926. ISIS

Russell, Bertrand. China und das Problem des fernen Ostens. Mit einer Einführung von KARL HAUSHOFER. Deutsche Uebersetzung von MARG. HETHEY. VI+224 S. München, Drei-Masken-Verlag, 1925. ISIS

Reviewed by F. LESSING, *Deutsche Literaturzeitung*, 1555-1558, 1926.

Van Hée, Louis (S. J.). The Ch'ou-jen chuan of YÜAN YÜAN. Translated from the French manuscript by FRANCES MARGUERITE CLARKE and ANNA ELIZABETH HOUGHTALING. *Isis*, 8, 103-118, 2 pl., 1926. ISIS

See under XVIII (2) A, above.

11. — JAPAN.

Kincaid, Zoë. Kabuki. The popular stage of Japan. Introduction by LAURENCE BINYON. XIV+385 p. London, MACMILLAN, 1925. ISIS

We have many English books on nô, but this is, as far as I know, the first on the popular stage of Japan, kabuki. It is based upon an intimate experience extending over many years. It is very well illustrated. G. S.

Murdoch, James. A history of Japan. Volume III. The Tokugawa epoch (1652-1868). Revised and edited by JOSEPH H. LONGFORD. London, KEGAN PAUL, 1926. ISIS

12. — ISRAEL.

Ben Judah, Eliezer (1858-1922). Thesaurus totius hebraitatis et veteris et recentioris auctore ELIEZER BEN JUDAH HIEROSOLOMYTANO. Vol. VI. Berlin-Schöneberg, Langenscheidt, 1925. ISIS

Reviewed by LUDWIG BLAU, *Deutsche Literaturzeitung*, 1385-1389, 1926.

Jack, J. W. The date of the Exodus in the light of external evidence. XIV+282 p., maps. Edinburgh, T. and T. CLARK, 1926. ISIS

Katz, Mordecai. Protection of the weak in the Talmud. (*Columbia University Oriental Studies*. Vol. XXIV). 87 p. New York, Columbia University Press, 1925. ISIS

Kirjath Sepher. A quarterly bibliographical review (in Hebrew) of the Jewish National and University Library in Jerusalem. Third year, nº 1, 80 p. Jerusalem, P. O. B. 36, Meah Shearim, June 1926. (Annual subscription, 10 sh.). ISIS

This number contains library notes and news, a bibliography of Hebraica and Judaica and of Palestine publications, also two studies notably one on ABRAHAM IBN EZRA (q. v., first half of XIIth century). Our every good wish to this new journal, very fittingly published by the Hebrew University of Jerusalem (see *Isis*, 8, 596). G. S.

Löw, Immanuel. Die Flora der Juden. Band III, Pedaliaceae-Zygophyllaceae. Veröffentlichungen der Alexander Kohut Memorial Foundation. Band III. XI+522 S. Wien, R. LÖWIT, 1925. ISIS

Reviewed by JULIUS RUSKA, *Isis*, 8, 210-211, 1926. For Band II, see *Isis*, 7, 275.

Macalister, Robert Alexander Stewart. A century of excavation in Palestine. 335 p., plates, and plan. London, Religious Tract Society, 1925. ISIS

Weinreich, M. Ein jiddisches wissenschaftliches Institut. *Zeit. d. deutsch. morgenl. Ges.*, N. F., vol. 5, 68-70, 1926. ISIS

A preliminary meeting was held in August 1925, at which a committee was appointed and proposals made for the establishment of a Yiddish Institute, with a Journal, to embrace departments of Philology, Pædagogy, History, and Economics. J. S.

Wolf, Lucien. Report on the « Marranos » or crypto-Jews of Portugal. 20 p. London, Anglo-Jewish Association, 1926. ISIS

13. — IRAN.

Geldner, Karl Friedrich. Die zoroastrische Religion (Das Avestâ). 2. Aufl. (*Religionsgesch. Lesebuch in Verbind. mit Fachgelehrten* hrsg. von A. BERTHOLET, I.) IV+54 S. Tübingen, J. C. B. MOHR (P. SIEBECK), 1926. ISIS

Reviewed by H. LOMMEL, *Deutsche Literaturzeitung*, 1740-1746, 1926.

Strzygowski, Josef. Altai-Iran und Völkerwanderung. Ziergeschichtliche Untersuchungen über den Eintritt der Wander-und Nord-

völker in die Treibhäuser geistigen Lebens. Mit 229 Abb. und 10 Lichtdrucktafeln. XII+319 S. (*Arbeiten des kunsthistorischen Instituts der k. k. Universität Wien*, Band V). Leipzig, HINRICHS, 1917. ISIS

Reviewed by JULIUS RUSKA, *Isis*, 8, 203-207, 1926; 4, 189.

Wesendonk, O. G. von. Urmensch und Seele in der iranischen Ueberlieferung. Ein Beitrag zur Religionsgeschichte des Hellenismus. 213 S. Hannover, Orient-Buchhandlung HEINZ LAFAIRE, 1924. ISIS

Reviewed by JULIUS RUSKA, *Isis*, 8, 207-209, 1926.

14. — ISLAM.

Campbell, Donald. Arabian medicine and its influence on the Middle Ages. 2 vols. Vol. 1, XV+208 p. ; vol. 2, 235 p. London, KEGAN PAUL, 1926. ISIS

Contents. Vol. 1. : 1. Greek medicine in its relation to the Arabians. 2. Arabic (medical) MSS. 3. The historiography of Islam, with special reference to the development of Arabic medical and philosophical literature. 4. Arabic medical writers and their works (The Eastern Caliphate). 5. Arabic medical writers and their works (The Western Caliphate). 6. The age of early Arabian rumours in the west. 7. The tide of Arabism in the intellectual currents of mediæval Europe. 8. The Latin translators and the college at Toledo. 9. The transmutors and the Arabist dominancy in Latin Europe. 10. The experimenters and the effect of their work on Arabist tradition in Europe. 11. Hellenism and Arabism in the fifteenth and sixteenth centuries. 12. A review of European literature and the medical curricula of European universities in the later Middle Ages.

Vol. 2 : Appendix 1. Latin translators of the Arabic work. Appendix 2. An investigation of the date and authorship of the Latin versions of the works of GALEN. Bibliography. Index.

Upon hearing of these volumes, I first regretted that I had not been able to avail myself of them for the preparation of my Introduction. But when I finally managed to see them, my regrets vanished. In spite of some learned trappings (lists of MSS. and the like) this is not a scholarly production, but a hasty and superficial compilation which does not seem to contain anything which could not be obtained in a better form, in earlier, much earlier publications. One wonders for what kind of readers this work was produced. The general reader will be repelled by the scholarly paraphernalia, while the scholar wanting information, say, on Arabic or Latin MSS. will prefer to consult more trustworthy guides, such as C. BROCKELMANN and M. STEINSCHNEIDER. The bibliography is uncritical, the best and the worst being put upon the same level. He who recalls the excellent works published many years ago in TRUBNER's Oriental Series, will be shocked at the inclusion of this one in the same collection. It is true some of STEINSCHNEIDER's valuable studies are now difficult to obtain, but a reprint of them would have been far more welcome than this unnecessary compilation. To illustrate the strange mixture of scholarship and slipshodness, the author has thought it necessary to give Arabic names in Arabic script, but in various cases this is done incorrectly : e. g. the Arabic name of AVICENNA is mispelled; in the transliteration long vowels are sometimes indicated, sometimes not. G. S.

Farmer, Henry George. The influence of music, from Arabic sources.

A lecture delivered before the Musical Association, London, 27th April, 1926. 29 p. London, HAROLD REEVES, 1926. (3 s. 6 d.). ISIS

The author's important studies on Muslim music have already been discussed many times in *Isis* (see chiefly VIII, 508-511; also VIII, 794, IX, 189). The present paper deals mainly with the objective influences of music as displayed in magical music, cosmical music, the harmony of the spheres, musical therapeutics and the doctrine of the ethos. His account is divided as follows : 1. Pagan times; 2. The Kitâb al-siyâsa (eighth century); 3. AL-KINDÎ (ninth century); 4. The Ikhwân al-Safâ' (tenth century); 5. Tenth century to seventeenth century; 6. Modern survivals. The cosmical interpretation of music is well illustrated by a table from AL-KINDÎ's Risâla fî ajzâ khabariyya fî-l-mûsîqî, wherein the strings of the lute are connected respectively with the quarters of the zodiac, elements, winds, seasons, humours, etc. A similar table of relationships (also reproduced) was explained by the Brethren of Purity, etc. I am glad to hear that the author is preparing critical editions and translations of the main Arabic musical treatises.

G. S.

Farmer, Henry George. Clues for the Arabian influence on European musical theory. *Journal of the Royal Asiatic Society*, 61-80, January 1925. (Also in pamphlet form, London, HAROLD REEVES). ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 508-511, 1926.

Ferrand, Gabriel. L'élément persan dans les textes nautiques arabes des XV^e^ et XVI^e^ siècles. *Journal Asiatique*, 193-257, avril-juin 1924. ISIS

Voir 33^e^ Bibliographie géogr. 1923, n^o^ 44.

Gaudefroy-Demonbynes, Maurice. Le pélerinage à la Mekke ; étude d'histoire religieuse. (*Annales du Musée Guimet*, Bibliothèque d'études, tome 33). VIII+332 p., 1 pl. Paris, Librairie orientaliste PAUL GEUTHNER, 1923. ISIS

Reviewed by D. B. MACDONALD, *Isis*, 8, 209-210, 1926.

Lammens, Henri (S. J.). Les sanctuaires préislamites dans l'Arabie occidentale. *Mélanges de l'Université Saint-Joseph*, Beyrouth (Grand Liban), t. 11, p. 37-173, 1926. ISIS

Meyerhof, Max. Le monde islamique. LIX+80 p. 59 pl. F. RIEDER et Cie., Paris, 1926. ISIS

Ouvrage de haute vulgarisation, bien informé, clairement écrit et abondamment illustré. Il se termine par une esquisse de l'état actuel du monde islamique, où l'auteur traite un bon nombre de questions brûlantes avec beaucoup de tact et d'impartialité. G. S.

Richmond, Ernest Tatham. Moslem architecture, 623 to 1516. Some causes and consequences. London, Royal Asiatic Society, 1926. ISIS

Schirmer, Oskar. Studien zur Astronomie der Araber. *Sitzungsberichte der Physikalisch-Medizinischen Sozietät zu Erlangen*, 58, 33-88, 1926.

1. Ungleichförmige Bewegung eines Gestirns auf dem Tierkreis nach THÂBIT BEN QURRA (826-901). 2. Arabische Bestimmungen der Schiefe der Ekliptik.

Schirmer, Oskar. Arabische Bestimmungen der Schiefe der Ekliptik. *Sitzungsberichte der Physikalisch-Medizinischen Sozietät zu Erlangen*, 58, 43-88, 1926. ISIS

The texts dealt with were written by the following astronomers : ABU MAḤMÛD AL-KHUJANDÎ; 'ALÎ IBN AḤMAD AL-NASAWÎ; AL-BÎRÛNÎ; IBN ABÎ SHUKR AL-MAGHRABÎ. The discussion of these texts is followed by a most interesting table showing the value of the obliquity of the ecliptic as determined by a number of Muslim astronomers from the VIIIth to the XVth century. An appendix (p. 63-79) contains the German translation of the first text Über die Neigung und die Breite der Länder, by AL-KHUJANDÎ (the Arabic text was edited by Father L. CHEIKHO in *al-Mashriq*, XI, 60-9, 1908). A second appendix contributed by EILHARD WIEDEMANN contains the translation of the introduction to AL-NASAWÎ's treatise « Die volle Befriedigung (ishbâ') in Bezug auf die Erklärung des Transversalsatzes »; that introduction is of special interest from the historical point of view. G. S.

Schoy, C. Behandlung einiger geometrischen Fragepunkte durch muslimische Mathematiker. *Isis*, 8, 254-263, 6 fig., 1926. ISIS

Geometrical problems solved by IBN AL HAITHAM. Demonstration of the sine theorem of spherical trigonometry by NAṢÎR AL-DÎN AL-TÛSÎ. It is hardly necessary to emphasize the importance of this and other investigations of our much lamented friend CARL SCHOY : they were based upon a first hand study of unpublished sources; each of them is a contribution of lasting value. G. S.

Schoy, C. Graeco-Arabische Studien nach mathematischen Handschriften der Vizeköniglichen Bibliothek zu Kairo, als Festgruss zum 70. Geburtstag des Herrn Prof. J. L. HEIBERG, Kopenhagen dargestellt. *Isis*, 8, 12 fig., p. 21-40, 1926. ISIS

Studies on the trisection of the angle and on the regular heptagon by AḤMAD IBN MUḤ. IBN 'ABD AL-JALÎL AL-SIJZÎ (951-1024) and his contemporary AL-QÛHÎ. Followed by fragments of the Arabic translation by THĀBIT IBN QURRA of a lost treatise of ARCHIMEDES on the regular heptagon. G. S.

Wiedemann, Eilhard und **Frank, Joseph.** Die Gebetszeiten im Islam. *Sitzungsberichte der Physikalisch-medizinischen Sozietät in Erlangen*, 58, 1-32, 1926. ISIS

PART III.

SYSTEMATIC CLASSIFICATION.

Including only the material which could not be included in Parts I and II. Hence studies on Japanese astronomy or on XIIth century astronomy are not classified below under astronomy, but above, respectively under Japan (in Part II) and XIIth Century (in Part I).

The sections forming Part III are classified as follows:

I. *Science in general* : 15. Bibliography; 16. History; 17. Organization; 18. Philosophy.

II. *Formal sciences* (Knowledge of forms) : 19. Logic and Theory of Knowledge; 20. Mathematics; 21. Statistical methods.

III. *Physical sciences* (Knowledge of inorganic nature); 22. Mechanics ; 23. Astronomy; 24. Physics ; 25. Chemistry (Physico-chemistry, Industrial chemistry); 26. Technology.

IV. *Biological sciences* (Knowledge of organic nature) : 27. Biology (Generalities, « Natural history »); 28. Botany (Agronomy, Phytopathology, Palaeobotany); 29. Zoology.

V. *Sciences of the earth* (implying knowledge of both organic and inorganic nature): 30. Geodesy; 31. Geography and Oceanography ; 32. Geology, Mineralogy, Paleaontology, Mining ; 33. Meteorology, Climatology and Terrestrial Physics.

VI. *Anthropological and historical sciences* (Knowledge of man, past and present): 34. Anatomy; 35. Physical anthropology (anthropometry and races of man); 36. Physiology (human and comparative); 37. Psychology (human and comparative) ; 38. Archaeology (generalities, methods); 39. Prehistory; 40. Ethnology (primitive and popular science); 41. Superstition and Occultism.

42. Economics (economic doctrines and history; commerce; transportation and communications); 43. Sociology, Jurisprudence and Positive Polity ; 44. History of Civilization (general history, historical methods, biography and chronology); 45. History of art (Art and science; Iconography; Arts and crafts); 46. History of Language, Writing and Literature; 47. History of morals (Moral organization of society); 48. History of Philosophy; 49. History of Religion (Science and religion).

VII. *Medicine* : 50. History, organization and philosophy of medicine ; 51. Epidemiology, History of special diseases. Public health and Social medicine; 52. History of hospitals and of medical teaching; 53. Pharmacy; Pharmacology; Toxicology.

VIII. *Education* (the methods of accumulating, imparting and diffusing knowledge); 54 Education (Generalities, Methods, Colleges, Universities) ; 55. Academies, societies, congresses, National and international organization of science; 56. Bibliography. (Methods, Librairies); 57. Museology (Museums and Collections).

IX. 58. Alia; 59. Errata.

The applied sciences are not disconnected from the pure sciences, but, as far as possible, the principles and applications of science are considered successively in the same section. However, applications based upon the principles of many sciences are dealt with separately (ex. technology ; medicine, education).

I. — SCIENCE IN GENERAL.

16. — HISTORY OF SCIENCE.

Barnes, Harry Elmer (*editor*). The history of science. Teaching and personalia. *Isis*, 8, 158-161, 1926. ISIS

1. Athens, National University of Greece. 2. Cambridge, Massachusetts, Harvard University. 3. Madison, Wisconsin. University of Wisconsin. 4.

Washington, D. C, ANSON PHELPS STOKES. 5. Necrology. Foundation members who have died during 1924 : THOMAS COMMERFORD MARTIN. EDMUND CLARK SANFORD. WILLIAM ALBERT LOCY (1857-1924).

Barnes, Harry Elmer (*editor*). The history of science : teaching and personalia. *Isis*, 8, 339-342, 1926. ISIS

I. The present state of instruction in the history of science in France by ABEL REY. II. The teaching of the history of science in Poland by FLORIAN ZNANIECKI. III. Professor WILLIAM A. LOCY (1857-1924) by WALTER LIBBY

Binoux, Louis François (died 1896). Prix Binoux (1889). *Isis*, 8, 161-163, 725, 1926. ISIS

Brief account of the history of that Prize awarded to historians of science by the Académie des Sciences of Paris, with list of awards from 1903 to 1924.

Gunther, Robert Theodore. Early science in Oxford. Vol. III. XII+564 p., many plates and text figures. Oxford, Printed for the subscribers, 1925. ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 375-377, 1926.

Gunther, Robert Theodore. The Lewis Evans collection at Oxford. Recent additions. *Nature*, 118, 160-161, 1926. ISIS

Holmyard, E. J. Science. An introductory text book. VI+230 p. 98 fig. in text. London, J. M. DENT and Sons, 1926. [4 s.] ISIS

This charming little textbook, a primer on general science, deserves special mention because of the many historical notices which it contains. The children studying it will not only have some knowledge of a relatively large number of scientific facts, they will also have some acquaintance with the history of science. An excellent idea. The many well-chosen illustrations include portraits of scientists : LEONARDO DA VINCI, NEWTON, ARISTOTLE, FARADAY, DALTON, Mme. CURIE, DARWIN and in the place of honor, Sir RONALD ROSS. G. S.

(**Isis**). Donations to *Isis*. *Isis*, 8, 164, 1926. Back numbers ; *Isis*, 8, 725, 1926. ISIS

Meade, George P. Youthful achievements of great scientists. *Scientific Monthly*, 21, 522-532, 1925. ISIS

« The points which this study will try to bring out are these : (1) that scientific genius manifests itself at an early age (usually before twenty-five, sometimes before twenty); (2) that this early work is not mere student activity, but original work of great importance and (3) that frequently it is the *most* important work of the man's career »

Ruska, Julius. Zweiter Jahresbericht des Instituts für Geschichte der Naturwissenschaften zu Heidelberg. 8 p. Heidelberg, 1926. ISIS

Sarton, George. A brief but urgent appeal to the friends of *Isis* and of the H. S. S. *Isis*, 8, 240, 1926. ISIS

Sarton, George. Preface to Volume VIII. *Isis*, 8, 7-11, 1926. ISIS

Sarton, George. Le sentiment du passé. *Isis*, 8, 391-402, 1926. ISIS

Nous nous efforcerons « de faire d'Isis, non pas seulement un instrument d'érudition qui soit dans son domaine aussi parfait que possible, mais aussi, et ceci importe peut-être davantage , un organe de synthèse scientifique et d'union intellectuelle. Nous voulons satisfaire autant que faire se peut tous ceux qui s'intéressent à l'Histoire de la Science, depuis ceux qui s'acharnent à résoudre des difficultés très spéciales jusqu'à ceux au contraire qui, ne s'embarrassant d'aucun détail, ne se préoccupent que de la valeur intellectuelle de nos études et de leur retentissement possible sur le progrès et l'unité de la science. »

Sarton, George (and others). Eighteenth critical bibliography of the history and philosophy of science and the history of civilization (to November 1925). *Isis*, 8, 526-667, 1926. ISIS

This bibliography contains 1019 notes some of which have been contributed by R. C. ARCHIBALD (Providence, R. I.), L. GUINET (Bruxelles), L. LEROUX (Paris), L. LELAND LOCKE (Brooklyn, N. Y.), D. B. MACDONALD (Hartford, Conn.); RAOUL M. MAY (Paris), H. METZGER (Paris), M. MEYERHOF (Cairo), R. PETIT (Paris), JULIUS RUSKA (Heidelberg): J. STEPHENSON (Edinburgh), A. D. TOLÉDANO (Paris), H. R. VIETS (Boston), H. WIELEITNER (Augsburg) and J. K. WRIGHT (New York).

Sarton, George (and others). Nineteenth critical bibliography of the history and philosophy of science and of the history of civilization. *Isis*, 8, 732-831, 1926. ISIS

This bibliography contains 844 notes, some of which have been contributed by T. L. DAVIS (Cambridge, Mass.); L. GUINET (Bruxelles), E. KREMERS (Madison, Wisconsin), R. M. MAY (Paris), J. STEPHENSON (Edinburgh) H. WIELEITNER (Augsburg), and J. K. Wright (New York). It also contains the first series of additions and corrections to SARTON's Introduction to the History of Science.

17. — ORGANIZATION OF SCIENCE.

(Internal organization is meant, see *Isis*, I, 195. For external, national and international, organization, see section 55).

Bulletin for scientific relations. (League of nations. Bulletins of the International Institute of Intellectual Co-operation). 1st Year. N° 1. July, 1926. Paris, Les Presses Universitaires de France, 1926. ISIS

«The aim of this Bulletin is to publish current information on international scientific relations. Part of the Bulletin will be devoted to a bibliography of important new scientific bibliographies. Part will be devoted to an account of such activities of scientific institutions or associations as have an international bearing. In particular it will deal with the founding of new institutions or associations; the appearance of new reviews; the organisation of the exchange of scientific publications; innovations in method or in the organisation of work; announcements of approaching congresses or conferences; motions and résolutions of congresses and conferences held during the year and so forth. The Bulletin will contain also, in summary form, the result

of inquiries set on foot by the International Institute of Intellectual Cooperation. All of these deal with problems that relate to the organisation of scientific work. »

International critical tables of numerical data, Physics, Chemistry, and Technology, prepared by the National Research Council of the U. S. of America. XX+415 p. New York, McGRAW-HILL Book Co., 1926. ISIS

18. — PHILOSOPHY OF SCIENCE.

Busco, Pierre. Les cosmogonies modernes et la théorie de la connaissance. 435 p. Paris, FÉLIX ALCAN, 1924. ISIS

Reviewed by L. GUINET, *Isis*, 8, 233, 1926.

Elsbach, A. C. Der Lebensgehalt der Wissenschaften. Wissenschaftstheoretische Grundfragen. 39 p. Berlin, WALTER DE GRUYTER, 1926. ISIS

1. Das Verhältnis von Alt und Neu; 2. Der empirische Ursprung; 3. Das ideale Ziel; 4. Leben und Denken; 5. Die Geschichte als Kriterium; 6. Biologie und Psychologie; 7. Die Stellung der Mathematik.

Inge (Very Rev.) **William Ralph.** Science and ultimate truth : Fison memorial lecture, 1926, delivered at Guy's Hospital Medical School, March 25, 1926. 32 p. London, LONGMANS, GREEN, 1926. ISIS

Lange, Friedrich Albert (1828-1875). Geschichte des Materialismus und Kritik seiner Bedeutung in der Gegenwart. Hrg. von HEINRICH SCHMIDT. 2 Bde. XII+404+532 S. 1 Bildnis. Leipzig, ALFRED KRÖNER, 1926. ISIS

Oppenheim, Paul. Die natürliche Ordnung der Wissenschaften. Grundgesetze der vergleichenden Wissenschaftslehre. VIII+288 S. 25 Abb. im Text. Jena, GUSTAV FISCHER, 1926. ISIS

This classification of the sciences and explanation of their many interrelations is based exclusively upon a logical analysis of the fundamental concepts and methods; it implies the notion of science as an organic and living whole. The author's aim is very different from the philosophic purpose of *Isis*, yet we have a common bond, the belief in the unity of science. He limits his task very clearly as follows « Wir haben es hier nur mit der Frage zu tun, wie die Wissenschaften in einem gegebenen Zeitpunkt, z. B. heute, geordnet sind, dagegen nicht mit der Frage, wie sie sich historisch-genetisch dahin entwickelt haben, auch nicht mit der Frage, warum gerade in einem bestimmten Augenblick die Ordnung so und nicht anders ist, obwohl auch diese Fragen vielleicht nur mit Hilfe unserer logischen Ergebnissen exakt beantwortet werden können. » Main divisions : Teil I. Induktive Grundlagen. 1. Wahl des Ordnungsprinzips. 2. Anwendung des gewählten Ordnungsprinzips. Teil II. Die Einzelwissenschaften. Teil III. Die endgültige Ordnung. 1. Statik. 2. Dynamik. 3. Ergebnisse. G. S.

Weyl, Hermann. Handbuch der Philosophie. Herausgegeben von A. BAEUMLER und M. SCHRÖTER. 4. Lieferung : Philosophie der Mathematik und Naturwissenschaft. Teil I. Mathematik. S. 1-64 ; 5. Lieferung. Teil II. Naturwissenschaft. S. 65-162. München, R. OLDENBOURG, 1926. ISIS

Diese beiden Lieferungen sind nicht einzeln käuflich, sondern nur im Rahmen des II. Bandes des ganzen, zunächst auf 5 Bände berechneten Unternehmens, der die Überschrift « Natur, Geist, Gott » trägt. Dass man diese Kapitel einem der ersten schaffenden Mathematiker übertrug, der sich mit der Philosophie (und auch der Geschichte der naturwissenschaftlichen Theorien) immerhin nur nebenher befasst hat, kennzeichnet natürlich die Ausführung. Diese gibt ein vorzügliches, freilich nur für Eingeweihte verständliches Bild der modernen Auffassungen in Mathematik und Physik (die Biologie ist nur ganz kurz einigemale erwähnt), eingesetzt in einen Rahmen, der gut aus Philosophie (Verf. ist Anhänger von HUSSERL's phänomenologischer Richtung) und Geschichte zusammengesetzt ist. Kein wirklicher Philosoph hätte jedenfalls den anderen Teil der Sache so verstanden wie WEYL, und auch in der Geschichte überrascht WEYL durch viel eigene Lektüre, (warum aber immer Huyghens statt HUYGENS ?) Sein Standpunkt gegenüber der Wirklichkeit ist ein über KANT hinausgehender transzendentaler Idealismus. Andere grosse Fragen, wie das Problem der Substanz, des Determinismus, der Kausalität glaubt er mit Recht nicht abschliessend beurteilen zu dürfen. Für einen exakten Forscher wie WEYL ist es selbstverständlich, dass er (gegen den Vitalismus jeder Art) an die Möglichkeit einer einheitlichen Naturerfassung glaubt. In der Mathematik steht WEYL bekanntlich auf Standpunkt des durch BROUWER eingeführten « Intuitionismus » (*Isis*, IX, 569). Man findet in den in ihrer Beschränktheit ausgezeichneten Ausführungen viele originelle Gedanken. Z. B. wird überraschen zu hören, dass der so viel geschmähte SCHELLING die moderne Entwicklung der Physik teilweise vorausgeahnt habe (S. 134). H. W.

Whitehead, Alfred North. Science and the modern world : Lowell lectures, 1925. XI+296 p. Cambridge, University Press, 1926. ISIS

Reviewed by S. ALEXANDER in *Nature*, 117, June 19, 847-850, 1926.

II. — FORMAL SCIENCES
(Knowledge of Forms).

19. — LOGIC AND THEORY OF KNOWLEDGE.

Enriques, Federigo. L'évolution de la logique. (Bibliothèque de synthèse scientifique). Traduit de l'Italien par G. E. MONOD-HERZEN. 204 p. Paris, ETIENNE CHIRON, 1926. ISIS

See *Isis*, 5, 469.

Keyser, Cassius J. Thinking about thinking. 91 p. New York, E. P. DUTTON, 1926. ($ 1). ISIS

This is a very delightful book which ought to be read by every young scientist (it would not hurt the older ones to read it too). If it induces the reader to approach KEYSER's more elaborate works : The new infinite and the old theology (New Haven, Yale, 1915); The human worth of rigorous thinking

(New York, Columbia, 1916; enlarged ed. 1925); Mathematical philosophy (New York, DUTTON, 1922) it will be justified. It is divided as follows: 1. Is all thinking organic behavior? 2. Autonomous or postulational thinking. 3. The importance and availability of autonomous thinking. 4. Detection of postulates. G. S.

Wasche, Hans. Grundzüge zu einer Logik der Arithmetik. 43 S. (*Bibliothek für Philosophie*, Bd. 29, *Arch. f. system. Philosophie und Soziologie*, Bd. 30, Heft 1-2, Beilage). Berlin, CARL HEYMANN, 1926. (3 Mk.)

Whitehead, Alfred North and **Russell, Bertrand.** Principia mathematica. Volume I, second edition, 1925. Cambridge University Press. XLVI+674 p. (New York, MACMILLAN). ISIS

Reviewed by HENRY M. SHEFFER, *Isis*, 8, 226-231, 1926.

Zaremba, Stanislaus. La logique des mathématiques. 52 p. Fasc. XV du *Mémorial des Sciences mathématiques*. Paris, GAUTHIER-VILLARS, 1926. ISIS

20. — MATHEMATICS.

Agostini, Amedeo. Il teorema fondamentale dell'algebra. *Periodico di Matematiche*, 4, p. 307-327, 1924. ISIS

Bosmans, Henri (S. J.). Note historique sur la forme singulière de certains raisonnements par réduction à l'absurde. *Sphinx-Oedipe*, 20e année, août 1925, p. 113-119. ISIS

Mémoire présenté à l'Association Française pour l'Avancement des Sciences, Congrès de Grenoble, Juillet-Août 1925.

Cajori, Florian. A notable case of finger-reckoning in America, *Isis*, 8, 325-327, 1926. ISIS

Cajori, Florian. WALTER WILLIAM ROUSE BALL (1850-1925). (With portrait). *Isis*, 8, 321-324, 1926. ISIS

Cajori, Florian. Early « proofs » of the impossibility of a fourth dimension of space. *Arch. di storia d. scienza*, 7, 25-28, 1926. ISIS

Des preuves de l'impossibilité d'une quatrième dimension ont été données par PTOLÉMÉE (SIMPLICIUS, ARISTOTELIS de Cœlo commentaria, éd. HEIBERG, 1894, 7a, 33), CLAVIUS (Sphæram JOANNIS DE SACRO BOSCO Commentarius, éd. Venise, 1601, p. 13-15), celle-ci reprise par G. S. A. MELLIN (Encyclopædisches Wörterb. der kritischen Philosophie, vol. IV, part II, 1802, Art. Raum), LEIBNIZ (die Theodicee, édit. J. H. VON KIRCHMANN, 1879, § 351, p. 375; œuvres de BLAISE PASCAL, éd. L. BRUNSCHVICG, P. BOUTROUX et F. GAZIER, vol. VIII, 1914, pp. 357-8, 365-7), par KANT (Werke, éd. K. ROSENKRANTZ u. F. W. SCHUBERT, vol. V, § 9, 25-7); et par WILLIAM WHEWELL (Philosophy of the inductive sciences, 3e éd., vol. I, 1858, p. 97). L. G.

Caro-Delvaille, Henri. Mural paintings illustrating the history of mathematics, in the Lincoln school of Teachers College, Columbia University, New York. Introduction by OTIS W. CALDWELL. Description by DAVID EUGENE SMITH, JOHN CLARK and VERA SANFORD (4 sheets, 32 by 49 cm., with colored reproductions of the paintings). New York, 1926. ISIS

This is a very remarkable attempt to popularize the history of mathematics by means of large mural paintings. Unfortunately the painter and his guides have tried to put too much in each painting, forgetting that the essence of art is simplification, synthesis, unity. Judging from the reproductions, the artistic value of these paintings is negligible. I am afraid that their educational value is not very great either, and for a similar reason : each painting is too crowded. G. S.

Enriques, Federigo. Conferenze sulla geometria non euclidea, per cura del Dott. OLEGARIO FERNANDEZ. 46 p. Bologna, N. ZANICHELLI, 1918. ISIS

Gandz, Solomon. On the origin of the term « root ». *American Mathematical Monthly*, 33, 261-265, 1926. ISIS

Karpinski, Louis Charles. The history of arithmetic. XII+200 p., ill. New York, RAND MCNALLY and Co., 1925. ISIS

Reviewed by FLORIAN CAJORI, *Isis*, 8, 231-232, 1926.

Lorey, W. GUSTAV ENESTRÖM (1852-1923). In memoriam. (With portrait). *Isis*, 8, 313-320, 1926. ISIS

Mair, David Beveridge. Fourfold geometry : being the elementary geometry of the four-dimensional world. VIII+183 p. London. METHUEN, 1926. ISIS

Maroger, A. Le problème de PAPPUS et ses cent premières solutions. Avec une préface de PAUL MONTEL, Professeur à la Sorbonne, VIII+384 p. avec fig. Paris, VUIBERT, 1925. ISIS

Reviewed in *Revue générale des sciences*, 37, 338, 1926.

Miller, G. A. Five fundamental concepts of pure mathematics. *Scientific monthly*, 19, 496-501, 1924. ISIS

Miller, G. A. Fundamental facts in the history of mathematics. *Scientific Monthly*, 21, 150-156, 1925. ISIS

Smith, David Eugene. The Roman numerals. 1st p. : problems of their origin ; 2d part : other problems of their history. *Scientia*, 40, 1-8, 69-78 ; trad. franç., supplém., 1-8, 17-26, 1926. ISIS

Rappel des théories sur l'origine des chiffres romains (T. MOMMSEN, K. ZANGEMEISTER, V. GARDTHAUSEN, LANZI, GESENIUS, K. FAULMANN, etc.) Le problème de l'origine, de l'histoire et du développement du système des

coefficients. L'influence des superstitions et du mysticisme religieux sur le remplacement d'un signe normal par un autre. La question des valeurs de position. L'omission du nombre M dans les nombres élevés, dès le XII^e S. Le I allongé, déjà assez ordinaire au XI^e S. L'addition des syllabes finales (dont la recherche de l'origine n'a pas encore été entreprise). Les combinaisons de chiffres romains et indo-arabes vers la fin du moyen-âge. Les problèmes que soulève l'emploi de la barre. L. G.

Smith, David Eugene. History of mathematics. Volume II. Special topics of elementary mathematics. XII+725 p. many illustrations. Boston, GINN, 1925. ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 221-225, 1926.

Strohal, Richard. Die Grundbegriffe der reinen Geometrie in ihrem Verhältnis zur Anschauung. Untersuchungen zur psychologischen Vorgeschichte der Definitionen, Axiome und Postulate. (*Wissenschaft und Hypothese*, 27). IV+137 S. Leipzig, TEUBNER, 1925. ISIS

Das Büchlein, das wohl nur durch pekuniäre Unterstützung zum Druck kam, möchte das, was es « die Vorgeschichte » der geometrischen Begriffe nennt, behandeln. Diese liegt nach dem Verf. in der Psychologie. Die « Elementarbegriffe » werden « durch Abstraktion » aus der Erfahrung erhalten (sie haben keine Merkmale! S. 63) und dann die Axiome daraus als analytische Sätze gewonnen. Ferner veranlasst uns die Erfahrung (S. 116) durch αἰτήματα (Forderungen) die logischen Möglichkeiten einzuschränken. Vf. exemplifiziert diese Anschauungen an den Darlegungen von LOBATSCHEFSKIJ und HILBERT, an welch letzterem er richtig Kritik übt. Die Grundprobleme der Geltung und der Widerspruchslosigkeit werden gar nicht behandelt. H. W.

Weyl, Hermann. Die heutige Erkenntnislage in der Mathematik. (Sonderdrucke des *Symposion*, Heft 3). II+32 S. Im Weltkreisverlag Erlangen, 1926. ISIS

Es handelt sich um die Begründung der Analysis, bzw. um die Theorie des Kontinuums, die durch L. E. I. BROUWER und den Verf. selbst wieder in den Vordergrund geschoben wurde. Der Verf. sucht hier eine möglichst objektive Schilderung der Lage zu geben. Seine Schrift hat 5 Abschnitte : I. Von ANAXAGORAS bis DEDEKIND. II. Die mengentheoretische Begründung der Mathematik. III. Die Antinomien und die RUSSELschen Stufen. IV. BROUWERS intuitive Mathematik. HILBERTS symbolische Mathematik. Diese Einteilung spiegelt gleichzeitig den historischen Werdegang wieder. H. W.

III. — PHYSICAL SCIENCES

(Knowledge of inorganic nature).

22. — MECHANICS

(Including celestial mechanics).

Andoyer, Henri. Cours de mécanique céleste. Tome II. 454 p. Paris, GAUTHIER-VILLARS, 1926. ISIS

Reviewed by MAURICE FRÉCHET, *Revue générale des Sciences*, 37, 475, 1926.

Dijksterhuis, Eduard Jan. Val en Worp. Een bijdrage tot de geschiedenis der Mechanica van ARISTOTELES tot NEWTON. VIII+466 p. Groningen, P. NOORDHOFF, 1925. ISIS

Reviewed by H. WIELEITNER, *Isis*, 8, 378-379, 1926.

Lodge, Oliver. On Prof. (D. C.) MILLER's ether drift experiment. *Nature*, 117, 854, June 19, 1926. ISIS

« One undoubted result does emerge from all this labour, namely, that the certain motion of the earth in its orbit fails to give any but a minute residual and doubtful effect — which is just the conclusion put forward by MICHELSON and MORLEY, a conclusion hitherto accepted by the scientific world. Beyond that there remains a residual effect to be discussed, and either established or negatived. The history of science has constantly shown that small residual effects *may* contain the germ of important discoveries. I hope that it may turn out so in the present instance, though I cannot say that I hope it with any confidence. »

Lunn, A. C. Experimental science and world geometry. *Science*, 63, 579-586, June 11, 1926. ISIS

Miller, Dayton C. Ether drift experiments. *Nature*, 117, 890, 1926. ISIS

Russell, Bertrand. The A B C of relativity. V+231 p. New York, HARPER and Bros., 1925. ISIS

23. — ASTRONOMY.

Abbot, Charles Greeley. The earth and the stars. XI+264 p., 33 plates, other illustrations. New York, D. VAN NOSTRAND Co., 1925. ISIS

Bévenot, Hugh G. The Weingarten planetarium. *Isis*, 8, 300-312, 2 pl., 1926. ISIS

Description, explanation and reconstruction of the planetarium painted upon one of the walls of the late-Gothic cloister of Weingarten Abbey, near the Lake of Constance. G. S.

Ciarcià, Salvatore. Il sistema cosmografico e i Padri della Chiesa. 117 p. Messina, ANTONIO SANO, 1923. ISIS

Reviewed by J. K. WRIGHT, *Isis*, 8, 212-213, 1926.

Hale, George E. Some new possibilities in solar research. Supplement to *Nature*, 1-8, July 3, 1926. ISIS

Hale, George Ellery. Beyond the Milky Way. XV+105 p. 43 ill., New York, SCRIBNER, 1926. ($ 1.50). ISIS

This continues the handsome series of astronomical essays reprinted from SCRIBNER's Magazine : The New Heavens 1922 (*Isis*, 5, 281), The Depths of the Universe 1924 (*Isis*, 7, 152-153). The present very attractive volume contains three papers : 1. *The oriental ancestry of the telescope.* Explaining

the evolution of astronomical instruments from the early days of Egypt to those of GALILEO. Illustrated description of TUTENKHAMON's transit instrument (merkhet) discovered by BREASTED (Chicago, Oriental Institute) and brief reference to another even more ancient, that of AMENHOTEP III (Berlin Museum), recently published by BORCHARDT. 2. *Heat from the stars.* Account of the astounding progress made since 1800 when Sir WILLIAM HERSHEL discovered the infra-red rays, ending with a very fine tribute to the late ERNEST FOX NICHOLS (1870-1924). 3. *Beyond the Milky Way.* A sketch of the progress of stellar astronomy from the days of HERSCHEL to those of the Mount Wilson Observatory. The book is beautifully illustrated; it reads like one of the Arabian tales. G. S.

Hillebrand, Karl. Die Entwicklung kosmischer Systeme. Versuch einer gemeinverständlichen Darstellung der gegenwärtigen Anschauungen über die Entwicklung von Weltsystemen und ihrer wissenschaftlichen Grundlagen. 90 S. Graz, LEUSCHNER und LUBENSKY, 1926. ISIS

Reviewed by WIELEITNER, *Mitt. zur Geschichte der Medizin*, 227, 1926.

Payne, Cecilia H. Stellar atmospheres ; a contribution to the observational study of high temperature in the reversing layers of stars. IX+215 p. Cambridge, Mass., Harvard University Press, 1925. ISIS

Proctor, Mary. Legends of the sun and moon. 159 p. London, GEORGE G. HARRAP, 1926. ISIS

Rufus, Will Carl. Astronomical observatories in the United States prior to 1848. *Scientific Monthly*, 19, 120-139, 1924. ISIS

24. — PHYSICS.

Auerbach, Felix. Modern magnetics. Translated by H. C. BOOTH. VII+306 p. London, METHUEN, 1925. ISIS

German original printed in 1921.

Ellis, T. D. The light-quantum theory. *Nature*, 117, 895-897, 1926. ISIS

Ferrand, G. Notes d'histoire orientale. Publ. de l'Institut des Hautes-Etudes Marocaines. Mélanges RENÉ BASSET, 1, p. 1-22, 1923 (*not seen*). ISIS

Deals with the history of the compass.

Graetz, Leo. Alte Vorstellungen und neue Tatsachen der Physik. Drei Vorlesungen. VIII+120 S. 11 Abb. Leipzig, Akad. Verlagsges., 1925. ISIS

Hoppe, Edmund. Geschichte der Physik. VIII+536 p. Braunschweig, FRIEDR. VIEWEG, 1926. ISIS

Says the author « Geschichte der Physik, nicht Geschichte der Physiker, auch nicht Geschichte der naturphilosophischen Anschauungen, nenne ich

dieses Buch. Wohl gibt es in den verschiedenen Zeitabschnitten mehr oder weniger vorherrschende Gesamtideen in der Physik, aber sie sind nur fruchtbar gewesen, soweit sie aus den Forschungsergebnissen über die Einzelprobleme hervorgegangen sind. Diese Einzelprobleme müssen konstitutiv sein für die Gesamtanschauung. Sie aber haben eine Geschichte ! Und die Geschichte dieser Probleme ist es, die ich darzustellen versuche. » The author has accomplished his task very well, and his work will be especially useful because he has taken pains to indicate the original sources, but in spite of his warnings, we can not consider this book a history of physics. The very purpose of such a history would be to show the continual interactions of each branch of physics upon all the others, their simultaneous development, the influence of other sciences upon them. HOPPE's fragmentary treatment hides these interactions, instead of revealing them. Each section of his book is comparable to the historical sections placed at the beginning of each chapter in a large treatise on physics. The history of applications has been avoided, but this is natural enough, as that history is a separate subject, of considerable intricacy. Moreover HOPPE dealt with the history of electrotechnics down to 1884, in his Geschichte der Elektrizität (Leipzig 1884). (By the way the publication of a second treatise on the history of science by the same author after 42 years, is a remarkable occurrence). The present account ends about the year 1895, and this too is a very natural procedure. I may add that the book is essentially devoted to modern times, the paragraphs dealing with antiquity or the Middle Ages being few in number. It will render great services especially to physicists, but I repeat, it is not, in my opinion, a history of physics, but rather a history of physical questions. It is as different from a history of physics, as a collection of manuals dealing with the histories of special sciences is different from a history of science. G. S.

Millikan, Robert Andrews. L'électron. Trad. sur la 2e édit. américaine par ADOLPHE LEPAPE. II+346 p., 42 fig., F. ALCAN, Paris, 1926. ISIS

L'édition anglaise de l'ouvrage de MILLIKAN a déjà été signalée (*Isis*, 7, 295). Se proposant d'exposer la preuve de la structure atomique de l'électricité, de décrire quelques unes des propriétés les plus importantes de l'électron, et d'examiner les conséquences qui découlent de ces propriétés au point de vue de la structure de l'atome, et de la nature de l'énergie rayonnante, l'auteur écrit l'histoire passionnante des théories de l'électricité depuis BENJAMIN FRANKLIN (1750), théories qui deviennent depuis vingt-cinq ans les théories de la matière, et à l'élaboration desquelles il a contribué pour une bonne part. Pour ne pas alourdir l'ouvrage, toutes les justifications mathématiques sont rejetées à la fin du volume, en appendices. — Le 9 novembre 1925, MILLIKAN apportait une nouvelle contribution à la physique de l'électron en annonçant à l'Académie des sciences de Madison (Wisc.) la découverte de nouveaux rayons, de très faible longueur d'onde, et cent fois plus pénétrants que les rayons RŒNTGEN, qui seraient d'origine cosmique et que l'on nomme couramment maintenant les rayons de MILLIKAN.
L. G.

Pollard, A. F. C. The decimal bibliographical classification of the Institut international de bibliographie. Partly translated for the formation and use of a universal bibliographical repertory concerning optics, light and cognate subjects. VII+110 p., Cambridge University Press, 1926. ISIS

« Abridged translation of the classification tables contained in the *Manuel*

du Répertoire bibliographique universel... The translation... is only intended to serve as a guide to the Decimal Index of the Transactions of the Optical Society » (*S. infra*).

Pollard, A. F. C. Subject Index of the Transactions of the Optical Society, vol. I-XXV, IV+90 p., Cambridge University Press, 1926. ISIS

« The subject index to vol. I - XXV of the *Transactions of the Optical Society* is here presented in the form of bibliographical notices drawn up in accordance with the methods and decimal notation of subject set forth in the manual upon the decimal bibliographical classification. The bibliographical notices are printed upon one side of slim paper » (*S. supra*).

Weiss, Pierre et Foëx, Gabriel. Le magnétisme. VIII+216 p., 69 fig. (*Collection Armand Colin*), A. COLIN, Paris, 1926. ISIS

Les deux auteurs de ce petit livre, qui ont pris l'un et l'autre une part prépondérante au développement des théories actuelles du magnétisme (hypothèse du champ moléculaire, 1907, théorie du magnéton, 1911, moment atomique, théorie du paramagnétisme des cristaux) se sont « proposé surtout de mettre le lecteur au courant des recherches récentes qui ne figurent guère encore que dans les mémoires originaux ». Ils indiquent comment on a interprété les résultats de ces recherches au moyen de la thermodynamique, de la mécanique statistique et de l'anisotropie des cristaux, et montrent jusqu'où la connaissance du moment atomique cadre avec le modèle admis pour l'atome; « les contradictions apparentes ou réelles qui subsistent vont susciter de nouvelles réflexions et de nouveaux travaux et seront ainsi une cause de progrès ». L. G.

25. — CHEMISTRY.

PHYSICO-CHEMISTRY, INDUSTRIAL CHEMISTRY.

Bloch, Ernst. Das chemische Affinitaetsproblem geschichtlich betrachtet. *Isis*, 8, p. 119-157, 1926. ISIS

I. Einleitung : Vorgeschichte. II. Die Vorherrschaft der mechanistischen Theorien (1660-1700). III. Die Vorherrschaft der Attraktionstheorien. (1700-1800). IV. Die Vorherrschaft der elektrochemischen Theorien (1800-1840). V. Die Uebergangszeit (1840-1900). VI. Das zwanzigste Jahrhundert. « Die chemische Affinitätslehre ist ein zu umfangreiches und schwieriges Gebiet, als dass sie mit *einem* hypothetischen Ansatz genug gefunden hätte. *Vier* Leitgedanken sind, seit sie zur Wissenschaft wurde, in ihr wirksam gewesen. Der *mechanistische*, nach kurzer Herrschaft in siebzehnten Jahrhundert bald verschollen, im neunzehnten Jahrhundert aber mit nachweisbarer Zwangsläufigkeit wieder hervortretend und Boden gewinnend; die Newtonsche *Attraktionshypothese*, im achtzehnten Jahrhundert fast alleinherrschend dann aber bis 1840, vom *electrochemischen Dualismus* fast ganz zurückgedrängt; dieser letzere von Anfang an auf wichtigen physikalisch-chemischen Tatsachen fussend und mindestens bei den Physikern stets in Geltung bleibend; die *plerotische* Grundidee endlich, die ganze Affinitätsfrage von anderem Gesichtspunkte betrachtend und zeitweise in Giltigkeit : so lösen sie zuerst einander ab, um vom Jahre 1840 an immer deutlicher in eine Vergeschwisterung einzutreten. Das zwanzigste Jahrhundert bringt eine neue Aera, da die neue Atomenlehre einschneidende Bedeutung für die Affinitätstheorie gewinnt, die bis dahin gleichsam nur ein Torso sein konnte.

Die Quantentheorie bestätigt die mechanistischen Hypothesen als zu Recht bestehend; der Elektronenaufbau des Atoms erweist die grosse Rolle elektrischer Kräfte bei chemischen Prozessen; Attraktionshypothese und Energetik bleiben in gewissen Zügen bestehen. »

Clark, C. H. Douglas. The basis of modern atomic theory. XX+292 p. London, METHUEN, 1926. ISIS

Reviewed by J. A. CROWTHER, *Nature*, 118, 365-366, 1926.

Foote, Paul Darwin. The alchemist. *Scientific Monthly*, 19, 239-262, 1924. ISIS

Lippmann, Edmund O. von. Kleine Beiträge zur Geschichte des Zuckers. *Die Deutsche Zuckerindustrie*, Nr. 19, 1926. ISIS

1. Zucker als Gift; 2. Karamel; 3. Die « Weihe » des Kalkofens; 4. Die erste deutsche Rübenzucker in England.

Lippmann, Edmund O von. Quellen zur Geschichte der Chemie und Alchemie in Italien. *Isis*, 8, 465-476, 1926. ISIS

Analysis of GIOV. CARBONELLI's sumptuous publication (Rome 1925) on some MS. sources for the study of chemistry and alchemy in Italy. Dr. v. LIPPMANN shows what CARBONELLI's book has to offer for the study of each period beginning with antiquity and the early middle ages, then for the IXth to XIIIth century, and for the XIVth to XVIth cent. G. S.

Lippmann, Edmund O, von. Zur Geschichte des Alkohols. Vortrag gehalten im Braunschweig-Hannoverschen Zweigverein des Vereins der Deutschen Zucker-Industrie am 24. März 1926 zu Hannover. *Die Deutsche Zuckerindustrie*, Nr. 17, Berlin, 1926. ISIS

Lowry, T. M. Electrons, atoms and molecules. *Nature*, Supplement to vol. 117, 33-40, 1926. ISIS

Mellor, Joseph William. A comprehensive treatise on inorganic and theoretical chemistry. Vol. 6 (Part II). Si, Silicates. X+1024 p. London, LONGMANS, GREEN, 1925. ISIS

Volumes 1 and 2, London 1922 *(Isis, 5, 285)*.

Pettersson, Hans and **Kirsch, Gerhard.** Atomzertrümmerung. Verwandlung der Elemente durch Bestrahlung mit α-Teilchen. VII+247 S., 61 Textfig., 1 Taf. Leipzig, Akadem. Verlagsgesellsch., 1926. ISIS

Reviewed by O. HAHN, *Deutsche Literaturzeitung*, 1562-1566, 1926.

Ray, Prafulla Chandra. « Makers of Modern Chemistry », CHUCKERVERTTY, CHATTERJEE & Co., Ltd. Calcuta; PROBSTHAIN & C° London, 1925. VIII+111 pages, boards, Rs 2-. ISIS

These Dacca University Extensions Lectures, delivered to an audience of junior and advanced students and teachers, and published almost in the form in which they were given, are especially interesting because they give

an account, by an eminent Hindu scholar, for an Hindu audience, of events which transpired in Europe during the renaissance of chemistry. They indicate an increase of interest in the history of science, and cannot fail to induce Hindu students of chemistry to wish for more of the same sort and to delve for themselves into the sources. May there be more such books — by non-Europeans — in order that we, in consequence, may learn more rapidly about the development of science in the Orient.

The title is deceptive, for the book deals not with the makers of modern chemistry but with those who laid the foundations upon which modern chemistry is superstructed, in particular, with those who clarified the phenomena of combustion. One of the chapters, pp. 79-90, tells of the early chemical knowledge of the Hindus, but tells only enough to send us back to RAY's larger work on the subject, now happily again in print.

TENNEY L. DAVIS.

Smith, Edgar F. Fragments relating to the history of chemistry in America. *Journal of Chemical Education*, 3, 629-637, 1926. ISIS

Thorpe, Jocelyn Field. The scope of organic chemistry. Address of the president of Section B—Chemistry—British Association for the Advancement of Science. Oxford, August 1926. *Science*, 64, 211-216, 236-240, 1926. ISIS

Wall, Edward John. The history of three-color photography. X+747 p., illustrated. Boston, Mass., American Photographic Publishing Co., 1925. ISIS

26. — TECHNOLOGY

(For mining, see 32. *geology; for industrial chemistry;* 25. *chemistry See also arts and crafts, under* 45.*)*

Bloch, Marc. Technique et évolution sociale. A propos de l'histoire de l'attelage et de celle de l'esclavage. *Revue de Synthèse Historique*, 41, 91-99, 1926. ISIS

A propos de l'ouvrage du commandant LEFEBVRE DES NOËTTES. La force motrice animale à travers les âges. VIII+138 p., 80 pl. Paris, BERGER-LEVRAULT, 1924.

Discussion intéressante des vues de l'auteur, qui entrainé par son enthousiasme semble avoir donné trop d'importance sociale au progrès de l'attelage. « La ferrure apparaît à Byzance vers le début du X^e siècle. C'est de là qu'elle s'est propagée en Occident, où son emploi semble se généraliser au XII^e siècle. Du X^e siècle également date le colier d'épaules; mais le témoignage des monuments figurés amène à voir en lui une invention de l'Europe occidentale. Il remplaça définitivement le procédé antique au XII^e siècle, au moment même où l'habitude de ferrer les chevaux s'imposait pour toujours. C'est dans ce siècle aussi que s'introduisit l'usage de la bricole, et en même temps, (si je comprends bien M. LEFEBVRE DES NOËTTES, dont l'exposé, d'ordinaire si clair, souffre ici de quelque obscurité) le dispositif en file. L'attelage moderne rationnel était créé. » MARC BLOCH montre que ces inventions, si remarquables qu'elles fussent, n'ont pas pu influencer considérablement l'évolution de l'esclavage. Celle-ci a été dominée beaucoup plus par des faits économiques et religieux. G. S.

Brenni, Luigi. La tessitura serica attraverso i secoli. Cenni sulle sue origini e il sio sviluppo in Como, nelle altre città italiane ed in alcuni stati europei. 136 p. Cesarie Nanie, Como, 1925. ISIS

Volume presque entièrement consacré à l'histoire du tissage de la soie naturelle en Italie (110 p.). La sériculture fut introduite en Sicile en 1146 ou 1148. Aux XV^e^ et XVI^e^ siècles, Come, Florence, Lucques, Venise, Gènes, étaient reines de l'industrie de la soie. Dans sa préface l'auteur rappelle les perfectionnements introduits par l'anglais J. KAY : amélioration du peigne en 1730, du mouvement de la navette en 1736; l'amélioration du métier par le français FALCON en 1728, celle de la trame par JACQUES DE VAUCANSON (et non Vancauson), (1745), et enfin l'admirable invention (1801-1804) de CHARLES MARIE JACQUARD (1752-1834). Quelques pages sont consacrées à l'Autriche, la Tchécoslovaquie, la France, l'Allemagne, l'Angleterre et la Suisse. L. G.

Chatterton, Edward Keble. Chats on naval prints. London, FISHER UNWIN, 1926. ISIS

Denman, R. P. G. Catalogue of the collections in the Science Museum, South Kensington ; with descriptive and historical notes and illustrations. Electrical communication. I. : Line telegraphy and telephony. 55 p., 12 plates. London, H. M. Stationery Office, 1926 (*not seen*). ISIS

Gordon, G. F. C. Clockmaking, past and present. With which is incorporated the more important portions of « Clocks, watches, and bells », by the late Lord GRIMTHORPE, relating to turret clocks and gravity escapements. VIII+232 p., 35 plates. London, CROSBY LOCKWOOD and Son, 1925. ISIS

Matschoss, Conrad (*editor*). Das deutsche Museum. Geschichte. Aufgaben. Ziele. Im Auftrage des Vereines Deutscher Ingenieure unter Mitwirkung hervorragender Vertreter der Technik und Naturwissenschaften bearbeitet. 364 p. illustrated. München, R. OLDENBOURG, 1925. ISIS

Splendid publication explaining the origin and development of this museum of science and technology which has been created in Munich in little more than twenty years and is already the leading museum of its kind in the world. There are a large number of illustrations, and in the place of honnor a portrait of OSKAR VON MILLER, who inspired and directed this great undertaking. A few articles dealing with generalities (history, building, etc.) are followed by a long series of special studies devoted to the various departments of the Museum, i. e. to the various branches of technology. Each of these studies has been prepared by a specialist. There are so many of them, that I can not enumerate them. G. S.

Stein, Henri. Archers d'autrefois ; archers d'aujourd'hui. 305 p., 20 pl., ill. Paris, D. A. LONGUET, 1925. ISIS

Reviewed in the *American Historical Review*, 31, 753, 1926.

Wins, Alphonse. L'horloge à travers les âges. Préface de JEAN CHALON. XXX+343 p. 163 gravures. Mons, LÉON DUQUESNE, 1924. ISIS

IV. — BIOLOGICAL SCIENCES
(Knowledge of organic nature).

27. — BIOLOGY.
(*Generalities*, « *Natural History* »).

Cowdry, Edmund Vincent (*editor*). General cytology ; a textbook of cellular structure and function for students of biology and medicine. 754 p., 173 fig., 9 plates. Chicago, University of Chicago Press, 1924. ISIS

Reviewed by RAOUL M. MAY. *Isis*, 8, 213-215, 1926.

Dürken, Bernhard. Die Hauptprobleme der Biologie. 3. durchgearb. Aufl. VIII+287 S., 25 Textabb. München, Jos. KÖSEL und FR. PUSTET, 1924. ISIS

Reviewed by H. KNIEP, *Deutsche Literaturzeitung*, 1566-1568, 1926.

Harris, D. Fraser, The biological approach to physics and chemistry. *Medical Life*, 33, 249-255, 1926. ISIS

Herelle, F. d'. The bacteriophage and its behaviour. Translated by GEORGE H. SMITH. XIV+629 p., illus. Baltimore, Md., WILLIAMS and WILKINS, 1926. ISIS

Jennings, Herbert Spencer. Biology and experimentation. *Science*, 64, 97-105, 1926. ISIS

Kerr, John Graham. Evolution. XII+278 p., 2 pl. London, MACMILLAN, 1926. ISIS

Reviewed by E. B. P., *Nature*, 118, 329-330, 1926.

Locy, William A. (1857-1924). The growth of biology. XIV+481 p. New York, HENRY HOLT, 1925. ISIS

Reviewed by STEPHEN D'IRSAY, *Isis*, 8, 513-514, 1926.

Loeb, Jacques (1859-1924). Les bases physicochimiques de la régénération. Traduit de l'anglais par H. MOUTON. 172 p., 115 fig. Paris, GAUTHIER-VILLARS, 1926. ISIS

Revue générale des sciences, 37, 342, 1926.

Lorenzini, Jean. Théorie des vitamines et ses applications ; essais de vitaminologie. 88 p., 8 pl. Paris, MASSON, 1925. ISIS

Reviewed by M. BERNHEIM, *Revue générale des sciences*, 37, 377-378, 1926.

Wilson, Edmund Beecher. The cell in development and heredity.

Third edition. 1232 p., 529 figs. New York, MACMILLAN, 1925. ISIS
Reviewed by RAOUL M. MAY, *Isis*, 8, 213-215, 1926.

28. — BOTANY.

(Agronomy, Phytopathology, Palaeobotany).

Aslin, Mary S. Catalogue of the printed books on agriculture published between 1471 and 1840. With notes on the authors. 331 p., illustrated. Rothamsted Experimental Station Library. 1926. ISIS

This very valuable catalogue covers the empirical period in agriculture beginning with the first printed book on the subject, the Liber ruralium comodorum of PETRUS CRESCENTIUS, Augsburg 1471. I extract from the foreword contributed by E. J. RUSSELL, Director of the Rothamsted Station, the following remark with regard to the end of that period : « The year 1840 marks a definitive stage in agricultural history. Up till then agriculture and agricultural books were almost exclusively empirical. Fortunately, however, not entirely; all through one finds writers who strove to get beyond the empirical facts and to discover the underlying principles. Their efforts, small and disconnected at first, can be traced like a growing stream throughout the long period to the closing forty years in which were crowded the achievements of the Geneva School of plant physiologists : DE SAUSSURE, SENEBIER and others; the application of chemistry to agriculture by the English chemist DAVY; the wider application of science to farm problems, and, still more important, the development of experimental methods of studying agricultural problems by the founder of modern agricultural science, BOUSSINGAULT. Finally, with dramatic suddenness all this work burst into fruition when in 1840, LIEBIG brought together the results of the earlier workers and deduced from them the simple laws of husbandry with which his name will always be associated; at the same time LAWES made the pot experiments which, within the next three years, were to lead to the founding both of the Rothamsted Experimental Station and of the artificial fertilizer industry. Up to 1840 agriculture had been based on empirical rules; after 1840 it was developed on scientific principles. » The books are classified as follows : English authors and translations (alphabetical list, chronological list). Foreign authors and translations (idem). A number of beautiful plates reproduce title pages of the most interesting items. This volume will be of service to students of botany and of the history of agriculture, a subject which has received lately considerable attention. G. S.

Bose, Sir Jagadis Chandra. The nervous mechanism of plants. XIX+ 224 p. London, LONGMANS, 1926. ISIS

Bower, Frederick Orpen. Plants and man ; a series of essays relating to the botany of ordinary life. XXI+365 p., illustrated. London, MACMILLAN, 1925. ISIS

Küster-Giessen, Ernst. Ueber die Zeichnungen der Blätter und Blüten. *Fortschritte der naturwissenschaftlichen Forschung*. Band XII. IV+ 83 S., 62 Text-abb. Berlin, URBAN und SCHWARZENBERG, 1926. ISIS

Die Vielheit gezeichneter Pflanzenorgane begründet K. im wesentlichen vom Standpunkt der Entwicklungsmechanik aus. K. stellte sich die Aufgabe

in seiner Darstellung zu ermitteln, welche äusseren und inneren Faktoren eine Zeichnung hervorrufen und auf ihre Ausbildung in irgend einer Weise von Einfluss sein können.

Lippmann, Edmund O. von. Geschichte der Rübe (Beta) als Kulturpflanze von den ältesten Zeiten an bis zum Erscheinen von ACHARD's Hauptwerk (1809). Festschrift zum 75.jährigen Bestande des Vereins der deutschen Zuckerindustrie. Mit einer Abb. VIII+184 S. Berlin, JULIUS SPRINGER, 1925. ISIS

Reviewed by JULIUS RUSKA, *Isis*, 8, 379-380, 1926.

Popenoe, Paul. The date-palm in antiquity. *Scientific Monthly*, 19, 313-325, 1924. ISIS

Rohde, Eleanour Sinclair. A garden of herbs. Revised and enlarged edition with new illustrations. London, HERBERT JENKINS, 1926. ISIS

The first edition published by LONGMANS GREEN in 1922, was reviewed in *Isis*, 5, 457-461; 6, 213.

Trelease, William. Four generations of memorable botanists. *Scientific Monthly*, 19, 53-62, 1924. ISIS

AUGUSTIN PYRAMUS DE CANDOLLE (1778-1841); ALPHONSE DE CANDOLLE (1806-1893); CASIMIR DE CANDOLLE (1836-1918); AUGUSTIN DE CANDOLLE (1868-1920). Brief notices with portraits. G. S.

Ungerer, E. Die Regulationen der Pflanzen. Ein System der ganzheitbezogenen Vorgänge bei den Pflanzen. Zweite erweiterte Auflage. (*Monographien aus dem Gesamtgebiet der Physiologie der Pflanzen und der Tiere*). XXIV+363 S. Berlin, JULIUS SPRINGER, 1926. ISIS

The first edition appeared in 1919. The aim of the book is « die grundsätzliche Berechtigung der teleologischen Betrachtungsweise und ihre Grenzen darzulegen und sie auf das gesamte Tatsachengebiet der wissenschaftlichen Botanik systematisch anzuwenden. » This is of great interest to the students of vitalism, and of biological philosophy in general. The new edition has been much increased. I hope to publish some time a full review of it in *Isis*, but have not yet found a contributor at once able and willing to do so. In the meanwhile I indicate the main subdivisions : 1. Grundlegung der Teleologie (Ganzheitbeurteilung). 2. Die teleologische Methode der Biologie. 3. Die pflanzlichen Harmonien. 4. Die pflanzlichen Regulationen. 5. Die teleologische Kennzeichnung des Organismus. Uebersicht über das Gefüge der Ganzheitbeurteilung in der Botanik (zugleich eine Zusammenstellung der vorgeschlagenen Bezeichnungen unter kurzer Festlegung ihrer Bedeutung.) G. S.

29. — ZOOLOGY.

Boubier, Maurice. L'évolution de l'ornithologie. II+308 p. (*Nouvelle collection scientifique*). Paris, FELIX ALCAN, 1925. ISIS

Reviewed by L. GUINET, *Isis*, 8, 515-517, 1926.

Howey, M. Oldfield. The encircled serpent : serpent symbolism

in all countries and ages. 423 p. London, W. RIDER and Son, 1926. ISIS

Lucas, Frederic A. Man and his creations. Some early restorations of animals of the past. *Natural History*, 26, 283-287, illustrated, 1926. ISIS

Pfizenmayer, E. Mammutleichen und Urwaldmenschen in Nordost-Siberien. 341 p. Leipzig, F. A. BROCKHAUS, 1926. ISIS

Zittel, Karl A. von. Grundzüge der Paläontologie (Paläozoologie). Neuarbeitet von FERDINAND BROILI und M. SCHLOSSER. Abteilung I : Invertebrata. Sechste verbesserte und vermehrte Auflage. VII+733 S. Abteilung 2 : Vertebrata. Vierte vermehrte und verbesserte Auflage. V+706 S. München, R. OLDENBOURG, 1923-1924. ISIS

V. — SCIENCES OF THE EARTH

(Implying knowledge of both organic and inorganic nature).

31. — GEOGRAPHY AND OCEANOGRAPHY.

Banse, Ewald. Lexikon der Geographie. 2 Bände. 1. Band 786 p. ; 2. Band 785 p. Braunschweig, G. WESTERMANN, 1923. ISIS

Bertacchi, Cosimo. Conversazioni geografiche. Per la storia della geografia in Italia. 262 p. Torino, FRATELLI BOCCA, 1925. ISIS

For the most part collected reprints of earlier publications : Per la storia della geografia in Italia nell'epoca contemporanea (deals in the main with the nineteenth century); L'Italia e il suo mare (historical sketch of Italian thalassographical researches from antiquity); Per il VII Congresso geografico italiano (methodological); Bologna e la geografia (on the Bolognese geographers of the 15th, 16th, and 17th centuries); La Cina e MATTEO RICCI (on MATTEO RICCI, the famous Jesuit missionary and geographer, see also GIUSEPPE CARACI, Il padre MATTEO RICCI (1552-1610) e la sua opera geografica, *Rivista geografica italiana*, vol. 25 to vol. 31, passim, 1918 to 1924); La geografia nella scienza, nella scuola e nella vita sociale; ANTONIO CECCHI e la politica coloniale dell'Italia (CECCHI (1849-1896) carried out explorations in Abyssinia). J. K. W.

Bujak, Franciszek. Studja geograficzno-historyczne. (Etudes d'histoire et géographie). XI+299 p. Warszawa, 1924. ISIS

Brief analysis of contents in 34e Bibliographie géographique, p. 13.

Cook, Albert Stanburrough. Beowulfian and Odyssean voyages. *Transactions of the Connecticut Academy of Arts and Sciences*, 28, 1-20, New Haven, Conn., February 1926. ISIS

Professor Cook points out an « array of correspondences between » certain passages describing sea voyages in the Odyssey and similar passages

in Beowulf. He also seeks to locate the route of Beowulf's voyage as passing from Bamborough (Northumberland) to Flamborough Head (Yorkshire).
J. K. W.

Eckert, Max. Die Kartenwissenschaft : Forschung und Grundlagen zu einer Kartographie als Wissenschaft. 2 Vols., vol. 1, 1921, XVI+640 p., 10 ills. 1 map ; vol. 2, 1925, XIV+880 p., 35 ills. Berlin, WALTER DE GRUYTER. ISIS

Reviewed by J. K. WRIGHT, *Isis*, 8, 517-519, 1926.

Hennig, Richard. Von rätselhaften Ländern ; versunkene Stätten der Geschichte. 326 S., 25 Abb. München, Delphin-Verlag, 1925. ISIS

Reviewed by RUDOLPH ZAUNICK, *Mitt. zur Geschichte der Medizin* 25, 168-169, 1926.

Keltie, Sir **John Scott** and **Gilmour, Samuel Carter.** Adventures of exploration. Book 4 : Africa. IV+180 p. London, GEORGE PHILIP and Son, 1926. ISIS

Le Bondidier, L. Histoire de l'exploration des Pyrénées. *Isis*, 8, 492-496, 1926. ISIS

Two letters written by L. LE BONDIDIER, keeper of the Pyrenean Museum of Lourdes, describing the Salle d'honneur of that Museum, which illustrates admirably the history of Pyrenean exploration. Brief introduction by GEORGE SARTON. G. S.

Lee, Ida (Mrs. CHARLES BRUCE MARRIOTT). Early explorers in Australia. From the log-books and journals, including the diary of ALLAN CUNNINGHAM, botanist, from March 1, 1817, to November 19, 1818. XII+651 p., 40 pl., 1 fig. London, METHUEN, 1925. ISIS

The first five chapters deal with the Australian portions of the voyages of WILLIAM DAMPIER (1652-1715), JAMES COOK (1728-1779), and others, and with early explorations in New South Wales; the remaining fourteen are devoted exclusively to the important botanical explorations of CUNNINGHAM in New South Wales and Queensland, and along the Australian coasts.
J. K. W.

McMurtrie, Douglas C. Printing geographic maps with movable types. 16 p., 7 fig. New York, privately printed, 1925. ISIS

Attempts to devise methods of printing geographical maps (not merely the names but the conventional symbols) were an outgrowth of the high cost of copper engraving. With the recent development of cheap photographic and other processes further experiments in typographic methods of map production have become unnecessary. Though the earliest important work of this sort discussed by MCMURTRIE was that of AUGUST GOTTLIEB PREUSCHEN in the latter part of the 18th century, as late as 1889 the Boston Type Foundry « developped a font of map type ». J. K. W.

Mecking, Ludwig. Die Polarwelt in ihrer kulturgeographischen Entwicklung besonders der jüngsten Zeit. (*Rede*). 19 S. Leipzig, Berlin, B. G. TEUBNER, 1925. ISIS

Nischer, Ernst. Oesterreichische Kartographen, ihr Leben, Lehren und Wirken. 192 p., 14 maps, 9 portraits. Oesterreichischer Bundesverlag für Unterricht, Wissenschaft und Kunst (vorm. Oesterreichischer Schulbücherverlag), no place (Vienna), no date (1922 or later). ISIS

A short history of the progress of the topographic mapping of the Austrian domains from the sixteenth to the nineteenth centuries, in the form of biographical sketches of the foremost cartographers and discussions of their work, with lists of maps and reproductions of specimens of outstanding topographic sheets. J. K. W.

Wagner, Henry R. The Spanish Southwest, 1542-1794. An annotated bibliography. 302 p., fascimiles. Berkeley, Calif., JAMES J. GILLICK, 1924. ISIS

Only 100 copies of this magnificent bibliography were printed. « The field covered... comprises those parts of the United States which formerly formed part of the province of New Spain ». In addition to strictly bibliographical details, scholarly discussions are given of the actual substance of many of the works listed. The volume, hence, should be indispensable to all students of the exploration, colonization, and historical geography of the region. J. K. W.

Wieder, F. C. (Librarian of the University of Leiden). Monumenta cartographica. Reproductions of unique and rare maps, plans and views in the actual size of the originals ; accompanied by cartographical monographs. Vol. I, 26 p., 25 pl. elephant folio. The Hague, MARTINUS NIJHOFF, 1925. ISIS

A splendid publication, so splendid unfortunately that relatively few people or libraries will be able to acquire it. The work will include five volumes to be completed by a general index. The first volume contains an interesting preface, 25 very large plates (maps and views) and explanations of them with references to other maps and other publications. Out of the 25 plates not less than 19 are views reproduced from the manuscript atlas of JOHANNES VINGBOONS (dated c. 1665 on each plate, and c. 1660 in the table of contents) — views of various harbors in the West and East Indies, S. Africa, America, China, India. Three other plates (1-3) are devoted to the globe of JOHANNES SCHÖNER 1523-24. The three remaining plates reproduce : Central Europe by N. B. 1553, Copper engraving published in Rome by MICHEL TRAMEZZINO; the Strait of MAGELLAN by THOMAS CAVENDISH. Original chart dated 1588 (The Hague); CORNELIS DOETSZ. Navigation chart to the North and the Baltic, 1610 issue of the unknown original of 1589, the reissue published at Amsterdam. My only criticism is the extravagant luxury of the publication; many of the plates of VINGBOONS atlas (which form the main bulk of this volume) are so simple that there was no necessity for reproducing them on such large scale. I am always pained when I see scientific interests sacrificed to snobbish considerations. G. S.

Wright, J. K. A plea for the history of geography. *Isis*, 8, 477-491, 1926. ISIS

Historical sketch of studies of the history of geography. The scope of the history of geography. The acquisition of geographical ideas. The character and expression of geographical ideas. Conclusion.

32. — GEOLOGY, MINERALOGY, PALAEONTOLOGY, MINING.

(For palaeobotany, palaeozoology and palaeoanthropology, see respectively 28. *botany*, 29. *zoology, and* 39. *prehistory).*

Ballore, Fernand de Montessus de (1851-1923). La géologie sismologique : les tremblements de terre. Avec une préface de PIERRE TERMIER, et une notice biographique de ARMAND RENIER. XIV+488 p., 118 fig., 16 pl. h. t. Paris, ARMAND COLIN, 1924. ISIS

Reviewed by L. GUINET, *Isis*, 8, 217-219, 1926.

Fairchild, Herman Leroy. The development of geologic science. *Scientific Monthly*, 19, 77-101, 1924. ISIS

Fischer, Hanns. Weltwenden : die grossen Fluten in Sage und Wirklichkeit. 2. erweit. Aufl. XII+230 S., 53 Abb. Leipzig, R. VOIGTLÄNDER, 1925. ISIS

Reviewed by RUDOLPH ZAUNICK, *Mitt. zur Geschichte der Medizin*, 25, 167, 1926.

Jessen, Otto. Tartessos-Atlantis. *Zeitschr. d. Gesch. f. Erdkunde* zu Berlin, 184-192, 1925. ISIS

Meunier, Stanislas. Dictionnaire de géologie. 716 p. Paris, DUNOD, 1926. ISIS

Parks, William Arthur. The development of stratigraphic geology and palaeontology in Canada. *Transactions of the Royal Society of Canada*, Sect. IV, vol. 16, 1-46 ; Ottawa, 1922. ISIS

Riem, Johannes Karl Richard. Die Sintflut in Sage und Wissenschaft. (Natur und Bibel in der Harmonie ihrer Offenbarungen, hg. von J. RIEM, 4). 194 S., 2 Zeichn., 1 Karte. Hamburg, 26 (Agentur des Rauhen Hauses), 1925. ISIS

Reviewed by RUDOLPH ZAUNICK, *Mitt. zur Geschichte der Medizin*, 25, 166-167, 1926.

33. — METEOROLOGY, CLIMATOLOGY AND TERRESTRIAL PHYSICS.

Fleming, John Ambrose. L'exploration magnétique et électrique de la terre : ses aspects physiques et cosmiques, et ses progrès. *Revue générale des Sciences*, 37, 454-467, 1926. ISIS

VI. — ANTHROPOLOGICAL AND HISTORICAL SCIENCES.

(Knowledge of man, past and present).

34. — ANATOMY.

Garrison, Fielding H. The principles of anatomic illustration before VESALIUS. An inquiry into the rationale of artistic anatomy. New York, PAUL B. HOEBER, 1926. ISIS

Howell, W. B. Some humble workers in the cause of anatomy a hundred years ago. *Annals of Medical History*, 8, 20-30, 1926. ISIS

Lint, J. G. de. Atlas of the history of medicine. I : Anatomy. London, H. K. LEWIS, 1926. ISIS

Dutch edition, Amsterdam 1925 (*Isis*, 9, 203.)

Tricot-Royer, Dr. L'âme dans l'art chrétien. Remarques anatomo-physiologiques. *Bul. Soc. Fr. Hist. Méd.*, 20, 271-286, 1926. ISIS

35. — PHYSICAL ANTHROPOLOGY.

(*Anthropometry and races of man*).

Pittard, Eugène. Race and history. XX+619 p., illustrated (including maps). London, KEGAN PAUL, 1926. ISIS

36. — PHYSIOLOGY

(*Human and comparative.*)

Barcroft, Joseph. The respiratory function of the blood. Part I : Lessons from high altitudes. X+207 p. Cambridge, University Press, 1925. ISIS

Fano, Giulio. Le cerveau et le cœur. Traduit de l'italien par G. CAPUTO. Préface du Prof. E. GLEY. (*Nouvelle Collection scientifique*). Paris, 211 p., FÉLIX ALCAN, 1925. ISIS

Reviewed by L. HÉDON. *Revue générale des Sciences*, 37, 377, 1926.

Haldane, J. S. and **Henderson, Yandell.** The rate of work done with an Egyptian shadouf. *Nature*, 118, 308-309, 1926. ISIS

37. — PSYCHOLOGY

(*Human and comparative*)

Dessoir, Max (*editor*). Der Okkultismus in Urkunden. Band I. WALTER VON GULAT-WELLENBURG, Graf CARL VON KLINCKOWSTROEM und

HANS ROSENBUSCH. Der physikalische Mediumnismus. VIII+494 p. Band II. RICHARD BAERWALD. Die intellektuellen Phänomene. VI+382 p. Berlin, ULLSTEIN, 1925. ISIS

Reviewed by A. A. ROBACK, *Isis*, 8, 728-731, 1926.

Doyle, Sir Arthur Conan. The history of spiritualism. In 2 vols. Vol. 1. XIII+342 p., 8 pl. Vol. 2. VII+342 p., 8 pl. London, CASSELL 1926. ISIS

Reviewed by R. J. TILLYARD, *Nature*, 118, 147-149,1926. That review has been the origin of a long controversy, see *Nature*, by index.

Troland, Leonard Thompson. The mystery of mind. XI+253 p., illustrated. New York, VAN NOSTRAND, 1926. ISIS

38. — ARCHEOLOGY

(Generalities, methods)

Sedgwick, Mrs. William T. (Mary Katrine (Rice)). Acome, the sky city : a study in Pueblo-Indian history and civilization. XIII+314 p., 33 pl. Cambridge, Mass., Harvard University Press, 1926. ISIS

39. — PREHISTORY.

Joulin, Léon. La protohistoire de l'Europe barbare d'après les découvertes archéologiques récentes. *Revue archéologique*, 18, 193-212, 1923. ISIS

Luquet, G. H. L'art et la religion des hommes fossiles. 234 p., 119 ill., MASSON et Cie, Paris, 1926. ISIS

Dans ce beau volume dédié à l' « auteur des Hommes fossiles », MARCELLIN BOULE (*Isis*, 6, 238), l'auteur entend faire pour la psychologie des hommes fossiles ce qu'a fait BOULE pour la constitution de nos plus lointains ancêtres, donner un exposé précis des données accumulées sur l'art de l'homme fossile, et interpréter ces données à la lumière de ce que nous savons des mentalités des primitifs actuels, et aussi à la lumière de la psychologie de l'enfant, telle qu'elle apparaît dans ses dessins. Il discute non seulement les documents que reproduit admirablement l'illustration de l'ouvrage, mais des quantités d'autres dont la référence est donnée avec grand soin,et auxquels il est donc possible de se reporter ; et l'interprétation à laquelle il s'arrête n'est pas toujours en accord avec celle de l'inventeur du document. (En particulier, il considère comme très problématique l'intention magique pour les scènes de la vie journalière, de genre ou de chasse, et pour les représentations isolées d'animaux non blessés ou d'hommes), Voici ses principales conclusion : Dès le début de l'âge du renne, et sans doute dès le moustérien, l'homme croyait à une survivance des morts et à l'efficacité de certaines pratiques destinées à agir sur eux. L'homme magdalénien croyait également possible d'exercer, par des opérations appropriées sur des simulacres d'animaux, une influence sur ces animaux. Mais l'art a été, au début, purement

désintéressé, qu'il ait été conçu comme art décoratif ou comme art figuré, ce dernier ayant peut-être fini par acquérir une destination magique à l'époque magdalénienne, époque à laquelle LUQUET admet l'existence de sorciers et de pratiques de sorcellerie; mais même dans les figurations à role magique vraisemblable, l'exécution a été soignée en vue d'un effet esthétique. L.G.

Moodie, Roy Lee. Studies in paleopathology (second series). I. A prehistoric surgical bandage from Peru. *Annals of Medical History*, 8, 69-72, 1926. II. Excess callus following fracture of the fore foot in a cretaceous dinosaur. III. Spondylitis deformans in a crocodile from the pleistocene of Cuba. *Annals of Medical History*, 8, 73-82, 1926. ISIS

See *Isis*, 6, 107-112, 1924.

Morgan, Jacques de (1857-1924). La préhistoire orientale. Ouvrage posthume publié par LOUIS GERMAIN, t. 1. Généralités. XXXVI+ 334 p., 55 fig. Paris, PAUL GEUTHNER, 1925. ISIS

Reviewed by L. GUINET, *Isis*, 8, 519-521, 1926.

Schetelig, Haakon. Préhistoire de la Norvège. (Instituttet for Sammenlignende Kulturforskning, Serie A, Forelesninger, 5). VI+ 280 p., 10 pl. Oslo, ASCHEHOUG, 1926. ISIS

40. — ETHNOLOGY

(Primitive and popular science).

Hellmann, Gustav. Ueber den Ursprung der volkstümlichen Wetterregeln (Bauernregeln). *Sitzungsberichte der Preussischen Akademie, Physik. Kl.*, 148-170, 1923. ISIS

Followed by a list of books on popular weather rules, classified by countries (p. 162-169). G. S.

Hoyt, Elizabeth Ellis. Primitive trade, its psychology and economics. London, KEGAN PAUL, 1926. ISIS

Leite de Vasconcellos, J. A Figa. Estudo de etnografia comparativa, precedido de algumas palavras a respeito do « Sobrenatural » na medicina popular portuguesa. 136 p., figs. Conferencia lida na Faculdade de medicina do Pôrto em 26 de Junho de 1925. (I Centenario da Régia escola de Cirurgia do Pôrto, 1825-1925). Pôrto-ARAUJO & SOBRINHO, 1925. ISIS

« Figa » is the Portuguese name of an act of contempt done with the hand, the fingers being clinched and the thumb sticking through the fore and middle finger. The same name is given to an amulet, representing a little hand, used to avert the evil eye. An elaborate study of these customs in Portugal is followed by comparisons with other European countries. Abundant illustrations. G. S.

Maass, Alfred. Sternkunde und Sterndeuterei im malaiischen Archipel.

Weltevreden, ALBRECHT & Co., 1924-1925. Overgedrukt uit het *Tijdschrift voor Indische Taal-, Land- en Volkenkunde*, Deel 64, 1-172, 347-459. ISIS

Reviewed by R. ZAUNICK, *Mitt. zur Geschichte der Medizin*, 227, 1926.

Malinowski, Bronislaw. Crime and custom in savage society. (International Library of Psychology, Philosophy and Scientific Method). XII+132 p., 6 plates. New York, HARCOURT, BRACE, 1926. ISIS

Manninen, Ilmari. Die dämonistischen Krankheiten im finnischen Volksaberglauben. Vergleichende volksmedizinische Untersuchung. 254 p. Communications 45. Helsinski, 1922. ISIS

Marin, L. Questionnaire d'ethnographie (Table d'analyse et Ethnographie). Extrait du *Bull. Soc. Ethnogr. de Paris*. 130 p. Paris, MAISONNEUVE, 1925. ISIS

Marzell, Heinrich. Bayerische Volksbotanik. Volkstümliche Anschauungen über Pflanzen im rechtsrheinischen Bayern. Buchschmuck von CONRAD SCHERZER. XXIV+252 S. Nürnberg, LORENZ SPINDLER, 1926. ISIS

Moret, Alexandre and **Davy, G.** From tribe to empire ; social organization among primitives and in the ancient East. (*The History of Civilization Series*). Translated by V. GORDON CHILDE. XXX+371 p., illus., maps. London, KEGAN PAUL, 1926. ISIS

Nieuwenhuis, A. W. Der Fetichismus im Indischen Archipel und seine psychologische Bedeutung. *Arch. f. Religionswiss.*, 23, 265-277, 1926. ISIS

A readable and interesting account, put together from original sources, of fetish worship among the Malays of Java, Celebes, Borneo, etc. J. S.

Preuss, K. Th. Das Problem der Mondmythologie im Lichte der lokalen Spezialforschung. *Arch. für Religionswiss.*, 23, 1-14, 1925. ISIS

A discussion of the moon-myths of the Uitóto Indians of Columbia, S. America, by one who has lived among them and taken part in one of their religious festivals. J. S.

Scheidt, Walter. Allgemeine Rassenkunde als Einführung in das Studium der Menschenrassen. Mit einem Anhang : Die Arbeitsweise der Rassenforschung von E. WAHLE. XIII+585 S., 144 Textabb., 15 schwarz, 6 farb. Tafeln. München, J. F. LEHMANN, 1925. ISIS

Reviewed by FRITZ LENZ, *Deutsche Literaturzeitung*, 1409-1416, 1926.

Smith, Edwin W. The golden stool : some aspects of the conflict

of cultures in modern Africa. 328 p. London, Holborn Publishing House, 1926. ISIS

Smith, Grafton Elliot. Elephants and ethnologists. Woodcuts by A. HORACE GERRARD and K. LEIGH-PEMBERTON. VIII+135 p., illustrations, plates and map. New York, E. P. DUTTON, 1924. ISIS

Reviewed by M. D. FOLLIN, *Isis*, 8, 215-217, 1926.

Weule, Karl. Cultural element in mankind : commencements and primitive forms of material culture. (*Cosmos Library*). 88 p. London, SIMPKIN MARSHALL, 1926. ISIS

Weule, Karl. The culture of the barbarians : a glimpse in the beginnings of the human mind. (*Cosmos Library*). 80 p. London, SIMPKIN MARSHALL, 1926. ISIS

Wright, Jonathan. The medicine of primitive man. *Medical Life*, 33, 274-281, 1926. ISIS

Zeiss, H.; Steppuhn, O. A.; Lewtschuk, A. Die russische Volksmedizin. *Archiv für Geschichte der Medizin*, 18, 261-266, 1926. ISIS

41. — SUPERSTITION AND OCCULTISM.

Frazer, Sir James George. Le rameau d'or. Edition abrégée, traduite par LADY FRAZER. 722 p. Paris, PAUL GEUTHNER, 1924. ISIS

Reviewed by L. GUINET, *Isis*, 8, 234-236, 1926.

Steiner, Rudolf und **Wegmann, Ita.** Grundlegendes für eine Erweiterung der Heilkunst nach geisteswissenschaftlichen Erkenntnissen. Erster Teil. 123 S., Dornach (Schweiz), Goetheanum, 1925. ISIS

Reviewed by RICHARD KOCH, *Mitt. zur Geschichte der Medizin*, 243-248, 1926

Waite, Arthur Edward. The secret tradition in alchemy : its development and records. XXII+415 p. New York, ALFRED A. KNOPF, 1926. ISIS

43. — SOCIOLOGY, JURISPRUDENCE AND POSITIVE POLITY.

Bloch, Iwan and **Loewenstein, Georg.** Die Prostitution. Bd. 2. 728 p. Berlin, LOUIS MARCUS, 1925. ISIS

Reviewed by STEPHEN D'IRSAY, *Isis*, 8, 521-525, 1926.

Bustamante y Sirvén, Antonio Sánchez de. The world court.

Translated by ELIZABETH F. READ. XXV+379 p. New York, MACMILLAN, 1925. ISIS

Darwin, Leonard. The need for eugenic reform. XVIII+529 p. London, JOHN MURRAY, 1926. ISIS

Reviewed by E. W. M., *Nature*, 118, 39-42, 1926.

Fehr, Hans. Das Recht im Bilde. 194 p., 222 ill. on 128 pl. Erlenbach-Zürich, EUGEN RENTSCH, 1923. ISIS

A rich collection of illustrations representing different forms of application of law, chiefly criminal law, with brief commentary. It deals largely with mediæval usage and is equally useful for the history of law and for the history of superstition. Most of the documents reproduced are of German origin. G. S.

Keller, Albrecht. Der Scharfrichter in der deutschen Kulturgeschichte. VIII+324 p. Bonn, KURT SCHROEDER, 1921. ISIS

Lee, Robert Warden. An introduction to Roman-Dutch law. Second edition. XLVIII+424 p. Oxford, Clarendon Press, 1926. ISIS

First edition published in 1915.

Pain, Jean. L'origine de l'inégalité sociale des sexes. *Mercure de France*, 1, 06, 1926, 343-370. ISIS

« A la différence d'EMILE DURKHEIM, qui pensait que la condition des femmes est un produit de représentations religieuses, sans autre fondement que ces représentations elles-mêmes, nous prétendons que ces croyances sont le symbole d'un phénomène réel : un conflit entre les sentiments individuels, développés par les rapports sexuels, et les sentiments collectifs développés par les mêmes rapports. La vie sexuelle a donné naissance à des croyances qui ont faussé les relations sociales; l'infériorité des femmes dans la vie civile et politique est donc, en définitive, le produit d'un développement morbide de la conscience humaine : c'est une maladie de l'instinct sexuel. » L. G.

Société de Géographie de Genève. Comité international de la Croix-Rouge, Ligue des Sociétés de la Croix-Rouge. *Matériaux pour l'étude des calamités*. Nos. 1 (avril-juin, 1924) -8 (janvier-mars, 1926). ISIS

This quarterly periodical represents a new movement of synthesis in scientific research. Great natural calamities are selected as objects of intensive comparative study in order that humanity may better understand them and hence cope with them more efficiently. The publication of the Matériaux « is closely allied to the proposal for a World Atlas of the geographical distribution of calamities, which the international Committee of the Red Cross... put forward » in 1923. The principal causes of the calamities studied, as indicated by the titles of the leading articles, are : earthquakes, tidal waves, volcanoes, landslides, avalanches, tropical cyclones, floods, icebergs, droughts, locusts, and epidemics. J. K. W.

Trenerry, C. F. The origin and early history of insurance, including

the contract of bottomry. XIV+330 p. London, P. S. KING, 1926. ISIS

Winfield, Percy Henry. The chief sources of English legal history. XVIII+374 p. Cambridge, Harvard University Press, 1925. ISIS

Reviewed by BERTHA HAVEN PUTNAM in the *American Historical Review*, 31, 763-764, 1926.

44. — HISTORY OF CIVILIZATION

(General History, Historical methods, Biography and Chronology).

Barnes, Harry Elmer. The new history and the social studies. XVII+605 p. New York, Century, 1925. ISIS

Reviewed by GASTON G. DEPT, *Isis*, 8, 380-382, 1926.

Friedensburg, Ferdinand. Münzkunde und Geldgeschichte der Einzelstaaten des Mittelalters und der neueren Zeit. VIII+196 S., 230 Abb. (*Hdbch. d. mittelalterl. u. neueren Gesch.*). München, OLDENBOURG, 1926. ISIS

Luschin von Ebengreuth, Arnold. Allgemeine Münzkunde und Geldgeschichte des Mittelalters und der neueren Zeit. XIX+333 S., 107 Abb. (*Handbuch d. mittelalterl. u. neueren Gesch.*). München, OLDENBOURG, 1926. ISIS

First published in 1904 (XVI+286 S.)

Macdonald, Arthur. History as a science. Reprinted from the *Calcutta Review*, February 1926, p. 277-302. Calcuttà University Press, 1926. ISIS

Another attempt to introduce quantitative method in historical research. G. S.

Marvin, Francis Sydney (*editor*). England and the world. (*The Unity Series*, VII). 270 p. London, Oxford University Press, 1926. ISIS

« This seventh volume of the « Unity » Series follows a school held at Bournemouth during the Easter week of 1925. It was suggested by a desire expressed at the International Moral Education Conference of 1922 at Geneva that the history taught to all nations of the world should have an international as well as a national bearing. It should have regard to the position of each nation in the international order, what each people has gained from, and given to, the others in the course of its evolution. This has been the inspiration of all the writers contributing to this book, and it is obviously an application of the ideas at the root of all the volumes in this series from the Unity of Western Civilization onwards.... The plan followed is similar to that in the previous volumes of the series. The first seven chapters give a brief historical survey of the subject; the last five discuss some of the leading practical problems which arise from it. » From the Preface.

The preceding volume of the same series, Science and Civilization, 1924, of special interest to our readers, was reviewed in *Isis*, 6, 119-121. I am glad

to announce that a new and cheaper edition of it has just been issued (1926). For other publications by the same author, see *Isis*, 4, 160, 452; 6, 244, 387-90 Contributors to this volume : W. J. PERRY, R. G. COLLINGWOOD, A. J. CARLYLE, A. J. GRANT, G. P. GOOCH, Miss L. M. PENSON, H. DODWELL, F. S. MARVIN, F. J. GOULD. G. S.

Pirenne, Henri. Histoire de Belgique. Vol. VI. La conquête française ; le Consulat et l'Empire ; le royaume des Pays-Bas ; la Révolution belge. VIII+477 p. Bruxelles, MAURICE LAMERTIN, 1926. ISIS

« Le contenu de ce volume, renfermé entre la bataille de Jemappes (6 novembre 1792) et le vote de l'indépendance de la Belgique par le Congrès National (18 novembre 1830), ne comprend pas tout à fait quarante années d'histoire. Mais que d'événements dans ces quarante années et avec quelle intensité ces événements ne se sont-ils pas imposés aux destinées du pays ! Jamais peut-être son caractère européen ne s'est attesté aussi clairement. »

The publication of this volume is mentioned to draw the reader's attention to the whole work, a monumental study, which is not simply of Belgian but of European interest. An English translation would be very desirable. G. S.

Thorndike, Lynn. A short history of civilization. XIV+619 p. Many maps and illustrations. New York, F. S. CROFTS, 1926. ISIS

« When the world war broke out in 1914, I determined to do what little I could to keep civilization alive. This volume is a contribution in that direction. I have written the book because I think it is needed. Historical students, investigators, writers, and readers have long since begun to turn away from the old tale of destruction to survey the past constructively, and to interest themselves in past culture as well as in purely political history. Yet so far there has been no adequate presentation of the main thread of the story of civilization between the covers of a single volume, or, for that matter, in any one work, at least in English. » It will suffice here to indicate the main divisions : 1. Prehistoric and primitive civilization. 2. Development of ancient civilization in the Near East. 3. Classical civilization and its decline. 4. Civilizations of the Far East. 5. Medieval civilizations of the Near East. 6. Revival of civilization in the West. 7. Early modern times. 8. The genesis of our present civilization. General bibliography. Steps in the development of civilization.

I have had no time to study, or even to read this volume, but it seems well informed and well balanced; it is clearly and forcibly written and the many illustrations were evidently chosen with care. G.S.

45. — HISTORY OF ART

(Art and science, Iconography, Arts and Crafts).

Luquet, G. H. Représentation par transparence de la grossesse dans l'art chrétien. *Revue archéologique*, 19, 137-149, 1924. ISIS

Sarton, George (*editor*). Medallic illustrations of the history of science. *Isis*, 8, 333-335, 4 pl., 1926. ISIS

First article of the first series which will be devoted to modern medals, i. e. those struck to commemorate men of science of the XIXth and XXth

centuries. This first article contains descriptions of five medals : CHEVREUL, VAN 'T HOFF, AMPÈRE, MONTELIUS, FABRE, together with 8 illustrations
G. S.

46. — HISTORY OF LANGUAGE, WRITING AND LITERATURE.

Alphabete und Schriftzeichen des Morgen- und Abendlandes. Zum allg. Gebr. m. bes. Berücks. des Buchgewerbes. 86 S. Berlin, Reichsdruckerei, 1924. ISIS

Reviewed by ERNST LEWY, *Deutsche Literaturzeitung*, 1681-1683, 1926.

Jellinek, M. H. Geschichte der gotischen Sprache (*Grundriss der germanischen Philologie*, Bd. I, 1). IX+209 S. Berlin, WALTER DE GRUYTER, 1926. ISIS

Jensen, Hans. Geschichte der Schrift. Mit 303 Abb., VIII+231 S., folio. Hannover, Orient-Buchhandlung HEINZ LAFAIRE, 1925. ISIS

Reviewed by JULIUS RUSKA, *Isis*, 8, 382-385, 814, 1926.

O'Grady, Standish Hayes and **Flower, Robin.** Catalogue of Irish manuscripts in the British Museum. 2 vol., 1300 p. London, British Museum, 1926. ISIS

Prou, Maurice. Manuel de paléographie latine et française. 4e édition refondue avec la collaboration d'ALAIN DE BOUÄRD. 1 vol. XII+511 p., 1 album de 24 pl. Paris, PICARD, 1924. ISIS

Sampson, John. The dialect of the Gypsies of Wales : being the older form of British Romani preserved in the speech of the clan of ABRAM WOOD. XXIII+230+419 p. Oxford, Clarendon Press, 1926. ISIS

Reviewed by R. L. TURNER, *Nature*, 118, 291-293, 1926.

Sköld, H. Woher stammen die ossetischen Lehnwörter im Ungarischen? *Zeit. f. Indologie und Iranistik*, 3, 179-186, 1925. ISIS

When the Ossetic words were incorporated into Hungarian, Ossetic was already split up into dialects. The loan-words in Hungarian are derived from a dialect which is the basis of modern Tagauric; in certain cases Hungarian has preserved older Ossetic forms, but there is no ground for the assumption of a third (now extinct) dialect. J. S.

Whymant, A. Neville J. A Mongolian grammar ; outlining the Khalkha Mongolian with notes on the Buriat, Kalmuck and Ordoss Mongolian. VIII+75 p. London, KEGAN PAUL, 1926. ISIS

The first Mongolian grammar in English.

47. — HISTORY OF MORALS

(Moral Organization of Society).

Sarton, George. Sur la tolérance intellectuelle. *Isis*, 8, 241-253, 1926. ISIS

« Si l'étude de l'histoire de la science ne nous a pas inculqué plus de tolérance intellectuelle, nous avons laissé s'en échapper le meilleur fruit, nous avons vraiment perdu notre temps à l'apprendre. Et d'ailleurs si nous sommes trop intolérants et d'un tempérament trop jaloux, il vaut mieux ne pas nous occuper d'histoire, car nous resterons incapables d'en avoir une vue juste et complète..... La mission suprême de l'historien et surtout de l'historien de la science, c'est d'augmenter la tolérance intellectuelle et ainsi d'adoucir la vie, et de rendre plus fécond l'héroisme de l'élite. »

48. — HISTORY OF PHILOSOPHY.

(See also above 18. *Philosophy of Science).*

Bréhier, Emile. Histoire de la philosophie. T. I. L'antiquité et le moyen-âge. 1. Introduction ; période hellénique. 262 p., F. ALCAN, Paris 1926. ISIS

M. EMILE BRÉHIER entreprend la publication d'une histoire de la philosophie, où il entend avec raison « rester en contact avec l'histoire politique générale, et l'histoire de toutes les disciplines de l'esprit » (p. 11), et qui s'annonce comme une œuvre considérable, encore que l'auteur la conçoive comme un ouvrage élémentaire. Le t. 1, qui doit courir jusqu'à la fin du XVI[e] S., comprendra trois parties, dont celle que j'ai entre les mains s'intéresse aux philosophes présocratiques (pp. 41-87), dont BRÉHIER considère les systèmes, non comme quelque chose de primitif, mais comme la forme élaborée d'une pensée beaucoup plus ancienne, à SOCRATE (p. 88-95), à PLATON et au platonisme au IV[e] siècle (96-167), et enfin à ARISTOTE et aux péripatéticiens après ARISTOTE. La plus grande partie de l'introduction est un saisissant raccourci des formes qu'a revétues l'histoire de la philosophie depuis la découverte par la Renaissance des compilateurs de la fin de l'antiquité. L. G.

Dingler, Hugo. Der Zusammenbruch der Wissenschaft, und der Primat der Philosophie. 400 p. München, ERNST REINHARDT, 1926.

DINGLER's important contributions to the philosophy of science have often been mentioned or dicussed in *Isis* (e. g. *Isis*, 6, 572; 7, 603). The spirit of the present volume is indicated by the following extract from the preface: « Im Mittelalter ermannte sich die Menschheit langsam zu neuem Denken. Zunächst äusserlich in Anknüpfung an die untergegangene Gedankenwelt der Griechen. Allmählich aber entstanden neue Methoden in Mathematik, Physik und Philosophie, die zu neuen Erfolgen der Wissenschaft führten. Nach und nach entwickelte sich eine methodologische Ueberzeugung über die Natur dieser Forschungen. Man glaubte es jetzt besser und klüger angefangen zu haben als die alten Griechen. Jetzt endlich glaubte man, den einzigen absolut unfehlbaren Weg zur Wissenschaft innezuhaben, es war der Weg der induktiven Naturwissenschaft, des Experimentes. Aber auch hier kamen nach Jahrhunderten von sieghaften Erfolgen Schwierigkeiten und mit ihnen kritische Denker, die nachzuforschen begannen, wie es mit dieser

absoluten Sicherheit bestellt sei. Und es stellte sich heraus, und damit sind wir schon ganz nahe an unsere Zeit gekommen, das wir nur Beschreibungen vom Realen zu geben vermöchten. Die verschiedenartigsten Beschreibungen traten auf, jede mit dem Anspruch auf Alleinrichtigkeit. Inzwischen aber wurden alle alten Gesetze der Wissenschaft in Frage gestellt, kamen ins Wanken, neue traten an ihre Stelle, in immer kürzeren Zwischenräumen wurden in ganzen Wissenschaften das Unterste zu oberst gekehrt und schliesslich entstand der Zustand, in dem wir uns befinden, den meist nur der wirklich sieht, der in den verschiedenen Wissenschaften bis auf den Grund geht, der aber besteht und ständig und unaufhaltsam wächst : der Zustand, wo nichts mehr wirklich sicher, alles möglich ist und zugleich alles behauptet wird, wo es keine Basis und keine Richtlinien mehr gibt, nichts, nichts, was sicher wäre — mit einem Wort, das Chaos, der Zusammenbruch. In dem stehen wir mitten drin. Das Publikum ahnt das nicht, und die Gelehrten verschliessen oft krampfhaft die Augen. Aber früher oder später wird es allen offenbar werden. » Contents : 1. Der Zusammenbruch der antiken Philosophie; 2. Der neue Zusammenbruch; 3. Der Gesichtspunkt des Systems; 4. Die Lehre vom Wesen der Wirklichkeit (Ontologie); 5. Das Problem der Geschichte; 6. Das Wunderbare; 7. Das Reich der Werte (Metaphysik, Ethik und Theologie); 8. Schlusswort. G. S.

Masson-Oursel, Paul. Comparative philosophy. (International Library of Psychology, Philosophy and Scientific Method). VI+212 p. London, KEGAN PAUL, New York, HARCOURT BRACE, 1926. ISIS

Original French text (Paris 1923) reviewed in *Isis*, 6, 99-104.

Parsons, Wm. Barclay. Relativity in thought. Commencement address. Pittsburgh, Pennsylvania, Carnegie Institute of Technology, June 9, 1926, 14 p. ISIS

49. — HISTORY OF RELIGION

(Science and Religion).

Clutton-Brock, Arthur. Essays on religion. With an introduction by Canon B. H. STREETER. London, METHUEN, 1926. ISIS

Donat, Josef (S. J.). Die Freiheit der Wissenschaft. Ein Gang durch das moderne Geistesleben. 3. Aufl. (Anastatischer Neudruck). XII+520 S. Innsbruck, FEL. RAUCH, 1925. ISIS

Reviewed by WIELEITNER, in *Mitt. zur Geschichte der Medizin*, 215-216, 1926.

Fleming, Daniel Johnson. Contacts with non Christian cultures. 189 p. New York, DORAN, 1923. ISIS

Reviewed in *Revue du Monde Musulman*, 62, 180-182, 1925.

Frazer, James George. Atys et Osiris. Etude de religions orientales comparées. Traduction française par HENRY PEYRE. (*Annales du Musée Guimet. Bibliothèque d'Etudes*, tome 35). 305 p. Paris, GEUTHNER, 1926. ISIS

Frazer, James George. Le bouc-émissaire. Etude comparée d'histoire des religions. Traduction française par PIERRE SAYN. VIII+ 468 p. Paris, PAUL GEUTHNER, 1926. ISIS

Les belles études d'histoire comparée des religions de Sir JAMES GEORGE FRAZER ont maintes fois été signalées ici (Voir en particulier, *Isis*, I, 184, 540; III, 127, 133; IV, 630; V, 535, 546, 563; VI, 201). J'ai rendu compte (VIII, 234-6) de la traduction française de l'édition abrégée du Rameau d'or. Voici que vient de paraître la traduction du Bouc Emissaire, qui constitue la sixième partie de l'édition complète du Rameau d'or. A la question du Bouc Emissaire, du Dieu qui meurt afin de délivrer ses adorateurs des meaux de toutes sortes (souffrances, maladies, mauvais esprit) qui les peuvent atteindre, question que l'auteur examine depuis sa formation chez le sauvage rusé et égoiste jusqu'à son plein épanouissement en la « sublime conception du Dieu qui, en mourant, se charge des péchés du monde », l'auteur a joint l'exposé du rite aztèque où des hommes et des femmes étaient écorchés et mis à mort, non plus en boucs émissaires, mais pour infuser un sang nouveau dans les veines desséchées des divinités qui conservent ainsi une force éternelle, et celui des saturnales romaines et autres fêtes similaires, par où est rejointe la mise à mort du Roi du Bois, à Aricie, qui constitue le point de départ du cycle entier du « Rameau d'Or ». — Il est regrettable que toutes les notes soient rejetées à la fin du volume. L. G.

Gaster, Moses. The Samaritans. Their history, doctrines and literature. (The Schweich Lectures, 1923). VII+208 p. For the British Academy by MILFORD, London, 1926. ISIS

Guppy, Henry. A brief sketch of the history of the transmission of the Bible down to the revised English version of 1881-1895. VII+ 75 p., 20 facsimiles. Manchester, University Press, 1926. ISIS

Harnack, Adolf von. Die Briefsammlung des Apostels PAULUS und die anderen vorkonstantinischen christlichen Briefsammlungen. 87 S. Leipzig, J. C. HINRICHS, 1926. ISIS

Reviewed by ADOLF DEISSMANN, *Deutsche Literaturzeitung*, 1281-1284, 1926.

(Herculano, Alexandre, 1810-1877). History of the origin and establishment of the Inquisition in Portugal. Translation from the Portuguese by the late JOHN CASPAR BANNER. Stanford University Press, 1926. ISIS

Kraeling, Carl H. A Mandaic bibliography. *Journ. American Oriental Society*, 46, 49-55, 1926. ISIS

Bibliography of the ancient religious sect of the Mandæans, who still survive in the swampy lowlands of Mesopotamia about Baṣra. Their history and that of their religion are of importance for the study of Gnosticism and Hellenistic religious developments, of Judaism and of nascent Christianity. J. S.

Nock, A. D. Eunuchs in ancient religion. *Arch. f. Religionswiss.*, 23, 25-33, 1925. ISIS

Eunuchs have no place in purely Greek or Roman cults, but figure pro-

minently in those of Oriental origin. The ancients believed that numerous sacred functions could only be performed properly by one who was qualified by perfect continence; and it is argued that the origin of religious castration is to be found in the selfmutilation of the eunuch in the enthusiasm of a great festival, in order that he may be perfectly fitted to serve through his whole life the object of his devotion. J. S.

Palmer, Frederic. Heretics, saints, and martyrs. VI+256 p. Cambridge, Mass., Harvard University Press, 1925. ISIS

Strack, Hermann Leberecht und Billerbeck, Paul. Kommentar zum Neuen Testament aus Talmud und Midrasch. 3. Band : Die Briefe des Neuen Testamentes und die Offenbarung JOHANNIS erläutert aus Talmud und Midrasch. VIII+857 S. München, C. H. BECK (OSCAR BECK), 1926. ISIS

Titius, Arthur. Natur und Gott. Ein Versuch zur Verständigung zwischen Naturwissenschaft und Theologie. X+851 S. Göttingen, VANDENHOECK und RUPRECHT, 1926. ISIS

Reviewed by WIELEITNER, *Mitt. zur Geschichte der Medizin*, 214-215, 1926.

Vuilliamy, Colwyn Edward. Immortal man: a study of funeral customs and of beliefs in regard to the nature and fate of the soul. 215 p. London, METHUEN, 1926. ISIS

VII. — MEDICINE.

50. — HISTORY, ORGANIZATION, AND PHILOSOPHY OF MEDICINE.

Asgis, Alfred J. History of stomatology. *Medical Life*, 33, 294-340, illustrated, 1926. ISIS

Bishop, Louis Faugères (with the collaboration of JOHN NEILSON, Jr.). History of cardiology. *Medical Life*, 33, 392-440, many illustrations, New York, 1926. ISIS

Blüher, Hans. Traktat über die Heilkunde, insbesondere die Neurosenlehre. 123 S. Jena, DIEDERICHS, 1926. ISIS

Reviewed by J. D. ACHELIS, *Mitt. zur Geschichte der Medizin*, 248-249, 1926.

Browning, William. Medical heredity, distinguished children of physicians (United States to 1910). Baltimore, the Norman Remington Co., 1925. ISIS

Reviewed by F. R. PACKARD, *Annals of Medical History*, 8, 210, 1926.

Cabanes, Auguste. Les curiosités de la médecine. Paris, Librairie E. LE FRANÇOIS, 1925. ISIS

Reviewed by FRANCIS R. PACKARD in *Annals of Medical History*, volume 8, 210, 1926.

Capparoni, Pietro. Profili bio-bibliografici di medici e naturalisti dal sec. XV° al sec. XVIII°. 130 p., 30 pl. Roma, Istituto naz. medico farmacol., 1925. ISIS

See *Isis*, 9, 196.

Dana, Charles L. The peaks of medical history, an outline of the evolution of medicine for the use of medical students and practitioners. 105 p., 40 pl., 16 fig. in text. New York, PAUL B. HOEBER, 1926. ISIS

Eloesser, Leo. Pirate and buccaneer doctors. *Annals of Medical History*, 8, 31-60, 1926. ISIS

Garrison, Fielding H. Medical numismatics. *Annals of Medical History*, 8, 128-135, 1926. ISIS

Gibbes, J. Heyward. Quacks and quackeries. *Scientific Monthly*, 21, 533-550, 1925. ISIS

Gould, George M. Medical dictionary. Edited by R. J. E. SCOTT. XI+1398 p. Philadelphia, Pa., P. BLAKISTON, 1926. ISIS

Hallé, Noël. De l'éducation médicale. Paris, Edition Spes, 1926. ISIS

Hallé, Noël. Eléments de philosophie médicale. Paris, RIVIÈRE, 1926. ISIS

Holländer, Eugen. Anekdoten aus der medizinischen Weltgeschichte. 224 S., 85 Textabb. Stuttgart, FERDINAND ENKE, 1925. ISIS

Honigmann, Georg. Das Wesen der Heilkunde. Historisch-genetische Einführung in die Medizin für Studierende und Ärzte. XII+319 S. Leipzig, FELIX MEINER, 1924. ISIS

Irsay, Stephen d'. Notes to the origin of the expression : « Atra mors ». *Isis*, 8, 328-332, 1926. ISIS

« It is possible that with SENECA begins the application of the epithet to acute fatal infections, continuing through GILLES DE CORBEIL and culminating in the XVIIth century's restriction of it to one specific disease. Constant consequences are often taken to designate events and processes and the shift from SENECA to GILLES and from GILLES to PONTANUS is thus very easy to understand ».

Jayne, Walter Addison. The healing gods of ancient civilizations. XXXIX+569 p., 7 pl. New Haven, Yale University Press, 1925. ISIS

Reviewed by F. H. GARRISON, *Annals of Medical History*, 8, 93, 1926.

Koopman, J. Bijdrage tot de geschiedenis der ontwikkeling van de

endocrinologie. *Bijdragen tot de geschiedenis der geneeskunde*, 6, 117-123, 1926. ISIS

Kruif, Paul de. Microbe hunters. New York, HARCOURT BRACE, 1926. ISIS

Reviewed by FIELDING H. GARRISON in *Medical Life*, 33, 199-201; and by HENRY BARTON JACOBS, p. 201-204, 1926.

Laignel-Lavastine et Vinchon, Jean. Des tempéraments bilieux et mélancoliques. *Bull. Soc. Franç. Hist. Méd.*, 20, 165-171, 1926. ISIS

Leake, Chauncey D. The historical development of surgical anesthesia. *Scientific Monthly*, 20, 304-328, 1925. ISIS

A valuable summary, well illustrated and followed by a chronology.

MacLaurin, C. Mere mortals. Medico-historical essays. New York, GEORGE H. DORAN, 1926. ISIS

Reviewed by HERMAN T. RADIN in *Medical Life*, 33, 208-212, 1926.

Meunier, Léon. History of medicine (translated in Russian by J. A. OKSENOV). Moscow, State Publications, 1926. ISIS

The french original edition (1911; 1924) was reviewed in *Isis*, 7, 319. For a review of this Russian translation by H. ZEISS see *Mitt. zur Geschichte der Medizin*, 1926, 250. The translator has added an appendix (p. 293-322) explaining briefly the development of medicine in Russia. G. S.

Monteiro, Hernâni. Origens da cirurgia portuense. (I Centenario da Régia Escola de Cirurgia do Pôrto, 1825-1925). 371 p., 33 fig. Pôrto, ARAÚJO & SOBRINHO, 1926. ISIS

Very elaborate history of Portuguese surgery, well illustrated. It is divided as follows : 1. From the XVIth century to the foundation of the Royal School (Régia Escola) in 1825 (202 p.); 2. The School of Porto from 1825 to 1885 (56 p.); 3. Portuguese anatomy and surgery from 1825 to 1885 (90 p.). List of surgeons and a longer notice devoted to one of the most famous, MANUEL JOAQUIM ALVES PASSOS, who died in 1881. No index. G. S.

Neuburger, Max. Die Lehre von der Heilkraft der Natur im Wandel der Zeiten. 212 S. Mit 2 Abbildungen. Stuttgart, FERDINAND ENKE, 1926. ISIS

The Hippocratic notion of the « vis naturæ medicatrix », the healing force of nature, is perhaps the most important thread running through the whole history of medicine. Every theorist of medicine was obliged to take position either for or against it. We must thus be grateful to MAX NEUBURGER, one of the great masters of medical history, to have devoted considerable time and thought to the elucidation of this very important subject. The main interest of the book is to show the gradual development of an idea, which started almost as an a priori mystical conception, and its gradual enrichment, as new discoveries were made and the mechanism of normal and pathological reactions was better understood.

NEUBURGER's work is divided as follows : 1. Antiquity and Middle Ages

(21 p.); 2. Sixteenth and seventeenth centuries (33 p.); 3. Eighteenth century (68 p.); 4. First half of nineteenth century (82 p.). G. S.

Neustaetter, Otto. Bilderatlas zur Geschichte des Krüppelwesens und der Orthopädie. Mit einer Einleitung. 160 Taf. und Abb. München, Mürchner Drucke, 1926. ISIS

Rolleston, Sir Humphrey, Bart. Poetry and physic. *Annals of Medical History*, 8, 1-15, 1926. ISIS

Ruhräh, John. Pediatrics of the past. An anthology. With a foreword by FIELDING H. GARRISON. XXVI+592 p., 54 text illustrations, 18 pl. New York, PAUL B. HOEBER, 1925. ISIS

Reviewed by GEORGE SARTON, *Isis*, 8, 386-388, 1926.

Salomonson, Joh. G. Barenspijn en haar bestrijding in den loop der tijden. *Bijdragen tot de geschiedenis der geneeskunde*. J. 6, 125-140, 1926. ISIS

Sérieux, Paul et Goulard, Roger. Le personnel médical de la Bastille. Médecins, chirurgiens, sage-femme, consultants et spécialistes. *Bull. Soc. Franç. Hist. Méd.*, 20, 178-198, 1926. ISIS

Sérieux, Paul et Goulard, Roger. Le service médical à la Bastille (suite et fin). *Bull. Soc. Franç. Hist. Méd.*, 20, 218-223, 1926. ISIS

Sudhoff, Karl. Essays in the history of medicine. Translated by various hands and edited with foreword and biographical sketch by FIELDING H. GARRISON. XIII+397 S. New York, Medical Life Press, 1926. ISIS

German edition, Jena, 1921, reviewed in *Isis*, 4, 558-560.

Sudhoff, Karl. Geschichte der Zahnkeilkunde. Zweite durchgesehene und ergänzte Auflage. Mit 134 Abbildungen im Text. VII+222 S. Leipzig, J. A. BARTH, 1926. ISIS

It is hardly necessary to underline the importance of a historical work composed by KARL SUDHOFF. His history of dentistry first published in 1921, appears now in a corrected and improved edition. It supersedes the previous works published by G. P. GEIST-JACOBI (Tübingen 1896) and VINCENZO GUARINI (Philadelphia 1909). It is enriched with 134 pointed illustrations, selected with great care. It is of course out of the question to summarize a work of such amplitude, but it is worth while to indicate how the material is distributed. It is divided into three main parts, as follows : 1. Prehistoric and primitive conditions. Ancient East. Early America (45 p.); II. Antiquity (68 p.); III. Middle Ages (Muslim and Christian), Renaissance, Modern Times down to the middle of the XIXth century (91 p.) It will be noted that the story stops about the middle of the last century. Enormous progress has been accomplished since then in the field of odontology and stomatology, but its account must be written, not by a general historian of medicine, but by a practitioner. The best general account of the latest developments is

still that by G. P. GEIST-JACOBI in the Handbuch der Geschichte der Medizin, vol. 3, 355-392, 1905. Each chapter is followed by an abundant bibliography. This small but significant work ought to be translated into English. G. S.

Unger, W. S. Tentoonstelling betreffende de geschiedenis der geneeskunde en natuurkunde in Zeeland. *Bijdragen tot de geschiedenis der geneeskunde*, 6, 191-199, 1926. ISIS

Vitorino, Pedro; Saavedra, Alberto. Catálogo da exposição retrospectiva de medicina. (I Centenario da régia escola de Cirurgia do Pôrto, 1825-1925). 101 p., 21 fig. Pôrto, Emp. Indust. Gráfica, 1925. ISIS

The medico-historical exhibition organized in June 1925 was very remarkable. Its well illustrated catalogue (21 fig. upon 16 pl.) is a contribution of lasting value to the history of medicine in Portugal. G. S.

Weyde, A. J. van der. Iets over het toezicht op de volksgezondheit te Utrecht in vroeger tijd. *Bijdragen tot de geschiedenis der geneeskunde*, 6, 199-205, 1926. ISIS

51. — EPIDEMIOLOGY, HISTORY OF SPECIAL DISEASES. PUBLIC HEALTH AND SOCIAL MEDICINE.

Baumann, E. D. Iets over de dysenterie in de zestiende en zeventiende eeuw. *Bijdragen tot de geschiedenis der geneeskunde*, 6, 156-174, 1926. ISIS

Chaumartin, Henry. L'abbaye de Saint Antoine de Viennois et le feu Saint-Antoine (*Thèse de médecine*, Lyon). 228 p., 8 pl., HENRI MARTIN, Vienne, 1926. ISIS

L'histoire du feu Saint-Antoine (ergotisme gangréneux) a amené l'auteur de cette thèse à écrire un raccourci de l'histoire de l'ordre religieux des Antonins, fondé en 1095 à La Motte Saint-Didier en Dauphiné (où vingt-cinq ans auparavant avaient été ramenés de Constantinople les restes de Saint Antoine, et qui s'appelle depuis Saint-Antoine de Viennois) par GASTON DE LA VALLOIRE et son fils GÉRIN pour secourir les victimes du feu Saint-Antoine, dont une terrible épidémie était apparue pour la première fois en Dauphiné en 1090. L'intercession à St. Antoine devint vite le seul remède efficace contre la maladie; les Antonins ajoutaient cependant, dans les établissements où ils recueillaient les malades l'amputation du membre sphacélé, à la prière. Le feu St. Antoine sévit surtout du milieu du X^{e} siècle jusqu'à la fin du XII^{e} : la première épidémie identifiée est celle de 857; la première bonne description est celle du chroniqueur rémois FRODOART; puis les épidémies se succèdent, coïncidant avec les années de famine qui faisaient suite à des années humides pendant lesquelles l'ergot du seigle se développe plus abondamment. Tantôt c'est une province qui est attaquée, tantôt une autre. Et si, à partir du XV^{e} siècle, les épidémies sont plus rares, on en signale cependant encore au XVII^{e} en France, au XVIII^{e} en Wurtemberg, en Silésie, etc. On ne connait plus de nos jours que quelques cas sporadiques. — L'ordre des Antonins, qui est en somme le fondateur de l'assistance pu-

blique en France, s'est incorporé à l'ordre de Malte en 1775, et a disparu totalement pendant la Révolution. — Travail extrèmement consciencieux, et qui semble redresser bien des erreurs, notamment sur l'histoire des premières années de l'ordre des Antonins. L. G.

Ebstein, Erich. Einige Beiträge zur Geschichte der sekundären Darmtuberkulose. *Archiv für Geschichte der Medizin*, 18, 202-208, 1926. ISIS

Flick, Lawrence. Development of our knowledge of tuberculosis. Philadelphia, 1925. ISIS

Reviewed by FRANCIS R. PACKARD in *Annals of Medical History*, 8, 208, 1926.

Gouin, J. and **Dewing, W.** Historique de la gale, ses traitements au XIX^e^ siècle. *Gazette médicale du Centre*, 15 nov., 859-898, 1925. ISIS

Honig, P. J. J., Swellengrebel, N. H. H. Bijdrage tot de geschiedenis der malaria in Nederland. *Bijdragen tot de geschiedenis der geneeskunde*, 6, 233-249, 1926. ISIS

Kahn, Max (1887-1926). Historical aspects of cancer research (written 1921). *Medical Life*, 33, 345-355, 1926. ISIS

Kahn, Max. History of the chemistry of renal and cystic calculi (with JACOB ROSENBLOOM). *Medical Life*, 33, 356-362, 1926. ISIS

Mazeyrie, J. Contribution à l'étude de la lèpre en France. La lèpre en Bas-Limousin (*Thèse médec.*, Lyon). 112 p., 11 pl., JUGLARD, Tulle, 1924. ISIS

Les premières données se rapportant à la lèpre en Bas-Limousin sont du XI^e^ S.; la maladie a sans doute été propagée par le grand nombre de lépreux qui traversaient le Limousin, venant du centre, de l'est, pour se rendre à St. Jacques de Compostelle. Dès le XII^e^ S., on trouve, en assez grand nombre des asiles de lépreux, d'ailleurs constitués en général par un simple groupement de cabannes, petit à petit remplacées, aux abords des bourgs et des villes, par de véritable *léproseries*, *maladreries* : dès le XIII^e^ S., il en existait au moins quarante cinq. Mais tandisque presque partout le lépreux était frappé de mort civile, dépouillé de la propriété de son patrimoine, il pouvait, en Bas-Limousin, acheter, vendre, traiter, disposer de son bien à son gré. Jusqu'au XIV^e^ S., ainsi relégués, les lépreux vivent à peu près en paix; mais en 1321, antérieurement à l'ordonnance de PHILIPPE V (21 juin) qui ordonnait de jeter en prison tous les ladres du royaume, un grand nombre d'entre eux furent livrés au bûcher sous le prétexte d'un grand complot ourdi par les lépreux : quarante cinq périrent ainsi à Uzerche en moins d'un mois ! Cependant, l'épidémie diminuait de virulence, les conditions de l'hygiène publique s'amélioraient peu à peu, le nombre des personnes contaminées diminuait très sensiblement au XV^e^ S., et vers la fin du XVI^e^, les léproseries disparaissaient, remplacées par des maisons-Dieu, des hopitaux, et à l'époque de la Révolution, il n'existait plus, en Bas-Limousin, de maisons spécialement destinées aux lépreux. Depuis 1894, l'auteur n'a pu relever, au registre d'entrée de l'hopital de Tulle, que quatre cas de lèpre.

— MAZEYRIE étudie également les saints guérisseurs : Loup et Eutrope, les fontaines vénérées, et les rares traces qu'a laissées la lèpre dans l'art local. L. G.

Schrijver, J. Nog eens : fames canina. *Bijdragen tot de geschiedenis der geneeskunde*, 6, 124, 1926. ISIS

See *Isis*, 9, 212.

Stévenin, Henri. La coqueluche. 214 p., E. FLAMMARION, Paris, 1926. ISIS

Le préambule de cette monographie est une histoire des connaissances relatives à la coqueluche. On trouve le mot coqueluche au XV^e^ siècle, mais il désigne alors la grippe; ce que nous appelons coqueluche est désigné sous le nom de quinte jusqu'à la fin du XVII^e^ siècle. Bien que la maladie soit vraisemblablement très ancienne, on n'en trouve aucune description, sinon peut-être chez AVICENNE (mais l'identification est difficile), avant 1578, chez GUILLAUME BAILLOU, doyen de la faculté de Paris; elle est ensuite décrite en 1673 par THOMAS WILLIS, à la même époque par SYDENHAM, cinquante ans plus tard par HUXHAM (1694-1768); puis se succèdent les descriptions de plus en plus étendues, de plus en plus précises; le microbe de la coqueluche n'est découvert qu'en 1900 par BORDET et GENGOU et ce sont alors de nouvelles méthodes de diagnostic, de nouvelles méthodes de traitement, et d'heureux essais de prévention. L. G.

52. — HISTORY OF HOSPITALS AND OF MEDICAL TEACHING.

(Birmingham). History of the Birmingham Medical School, 1825-1925. 96 p. Birmingham, CORNISH, 1925. ISIS

Hellinga, G. Een en ander over de positie der 17^de^ en 18^de^ eeuwsche gasthuis-chirurgijns in Amsterdam. *Bijdragen tot de geschiedenis der geneeskunde*, 6, 145-156, 1926. ISIS

Lemos, Maximiliano (1860-1923). História do Ensino Médico no Pôrto. (I Centenario da Faculdade de Medicina do Pôrto MDCCCXXV-MCMXXV) Desenhos de SALAZAR. 245 p. Pôrto, Enciclopédia Portuguesa, 1925. ISIS

This handsome publication is a very fitting memorial of the first centenary of the Faculty of Medicine of Porto. It tells the history of that Faculty. No less than 70 professors have succeeded one another in that Faculty, beginning with VICENTE JOSÉ DE CARVALHO (1792-1851). The book contains a number of biographies of these professors (stopping at no. 46 of the whole series), supplemented by lists of their writings and good portraits drawn by SALAZAR. This is an important contribution not only to the history of Portuguese medicine but also to the history of medical teaching in general. G. S.

Monteiro, Hernani. História do Ensino Médico no Pôrto. Suplemento coordenado. (I Centenario da Faculdade de Medicina do Pôrto, MDCCCXXV-MCMXXV). Desenhos de SALAZAR. 94 p. portraits. Pôrto, Enciclopédia Portuguesa, 1925. ISIS

Supplement to LEMO's history above-mentionned. It contains a number of additional biographies, with portraits and bibliographies : ROBERTO FRIAS, MAXIMILIANO LEMOS (1860-1923), founder in 1886 of the *Arquivos de historia da medicina portuguesa* (see *Isis*, 2, 145); CLEMENTE PINTO; DIAS DE ALMEIDA; JOÃO DE MEIRA; JÚLIO DE MATOS. G. S.

VIII. — EDUCATION

(The methods of accumulating, imparting und diffusing knowledge.)

54. — EDUCATION

(Generalities, Methods, Colleges, Universities),

Hepburn, William Murray and **Sears, Louis Martin.** Purdue University : fifty years of progress. VI+203 p. Indianapolis, HOLLENBECK Press, 1925. ISIS

Thwing, Charles Franklin. The college president. X+345 p. New York, MACMILLAN, 1926. ISIS

Winchester College Archeological Society. Winchester College : its history, buildings, and customs. Winchester, P. and G. WELLS, 1926. ISIS

55. — ACADEMIES, SOCIETIES, CONGRESSES. NATIONAL AND INTERNATIONAL ORGANIZATION OF SCIENCE.

(Societies and congresses devoted to particular sciences are classified under those sciences. For the internal organization of science. — Isis, I, 195 — see section 17 above.)

(Danzig, Naturforschende Gesellschaft). LAKOWITZ, KONRAD. Hauptverzeichnis aller Veröffentlichungen der Naturforschenden Gesellschaft zu Danzig seit ihrer Begründung 1743 bis zum Abschluss des XV. Bandes der Neuen Folge ihrer Schriften 1922. 51 S. Danzig, 1924.

56. — BIBLIOGRAPHY

(Methods, Libraries).

MacNair, Mary W. A list of American doctoral dissertations printed in 1924. VII+173 p. Library of Congress, Washington, D. C. 1926. ISIS

Sensburg, Waldemar. Die bayerischen Bibliotheken. Ein geschichtlicher Überblick mit besonderer Berücksichtigung der öffent-

lichen wissenschaftlichen Bibliotheken. VIII+172 S., 37 Abb. München, Bayerland-Verlag, 1926. ISIS

Sparn, Enrique. El crecimiento de las grandes bibliotecas de la tierra durante el primer cuarto del siglo XX. T. 1. Las bibliotecas universitarias y afines con más de 100,000 volumenes. 46 p. Cordoba (Rep. Argentina); Acad. nacional de Ciencias, 1926. ISIS

Reviewed by W. GIESE, *Deutsche Literaturzeitung*, 1585-1586, 1926.

57. — MUSEOLOGY

(Museums and Collections).

Jacobi, Arnold. Fünfzig Jahre Museum für Völkerkunde zu Dresden (1875-1925). 79 S., 8 Taf., 5 Abb. im Text. Berlin und Dresden, JUL. BARD Verlag, 1925. ISIS

Rowley, John. Taxidermy and museum exhibition. Preface by FRANK M. CHAPMAN. XVI+331 p., 29 pl., 20 figs. in text. New York, D. APPLETON and Co., 1925.

59. — ERRATA No. 13.

(For previous errata, see Isis, IX, 214).

Vol. VI, 290. Under 3° read 207 instead of 290 (see vol. VIII, 708, note 38).
Vol. VII, 328. Note MATISSE, read MEYER instead of MAYER.
Vol. VIII, 238. Read S. XVIII (instead of XVII).
469. L. 24, erst um 1250.
473. last line. legen auch den Recipienten.
513. 2nd line of last paragraph. read *as* instead of *like*.
531. 4th note. WELLMANN.
544. note STRUIK. PAUL OF MIDDELBURG died in 1534 (not 1553).
618. 3rd note. Read MAGGINNIS, JAMES PORTER.

A few other misprints are not mentioned in these errata because they are too obvious to cause any error or confusion. I wish to express my thankfulness to the readers who take the trouble to make the above-mentionned corrections in their set of *Isis*. I would advise them, after having accomplished that little task, to write their initials near mine at the bottom of this note, thus to indicate that these and the previous errata have been taken into account. G. S.

These and previous errata have been corrected by...

Author's Index to the Twenty First Bibliography

The Roman figures refer to centuries; the Arabic figures, to the sections of Parts II and III, which are numbered consecutively from 1 to 59. This index will enable one to find more easily the papers analyzed in the present bibliography, and also to see at a glance what each writer is doing.

November 24, 1926. DOROTHY WATERMAN.

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